

ACTIVATING SPACES:
A PRACTICE-BASED EXPLORATION OF THE ROLE
OF INTERACTIVITY IN PUBLIC SPACE

by Anja Patricia Braun

German Diplom (M.Des) in Design of Communication, University of Fine Arts HBKsaar,
Germany, 2009

A thesis submitted in partial fulfilment of the requirements for the degree of

Master of Applied Art in Design

Emily Carr University of Art + Design

Vancouver, British Columbia

ABSTRACT

Digital media technologies are shaping the experience of public space. This is even more true as systems evolve that can sense and react to what is happening around them. With this informational reshaping of our urban environment, designers are called on to critically engage and create legible moments in the multiple fluid realities of our cities. This thesis project explores the role that design interventions might have in revealing the plasticity of the built environment and public space. The messages that are projected in public space are made up of content that is shaped by its surroundings, that is to say the reception of a given message is dependent not only on the media or story for its legibility, but also on the constantly changing physical context of the space and its characteristics. This thesis project attempts to discover a methodology for evaluating the delivery of content in relation to the changing physical context of its transmission within space.

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ACKNOWLEDGEMENTS

First I would like to thank my family for supporting me, my studies, and my stay abroad. Many thanks to my partner Uwe for supporting me when times got rough and for sharing my joy when things went well. Also thanks to all of my friends who reminded me of my life besides the thesis.

I am indebted to the German National Academic Foundation for funding the first year in the Masters program with a full Post-Graduate Scholarship.

I owe a special debt of gratitude to my supervisors Marc Baumgartner and Dr. Glen Lowry for keeping me on track—your reflections have helped immensely in the final sprint for the finishing line. Thanks also to Karolle Wall and Dr. Randy Lee Cutler for reading, editing and critiquing my thesis.

I also want to thank Kate Armstrong for taking on the role as an external reviewer, for great feedback, and for bringing a new perspective to the work.

Special thanks to Helgi Kristinsson for providing technological support, to Karen Garrett de Luna for productive programming help, great motivation, and for critically proofreading my thesis, and also to Charles Lin for comments and edits along the process of writing.

Finally, many thanks to my dear friend Sirine Hawari for the two shared years, and to my dear friend Antonio, who was a great motivation to work within the university system.

I INTRODUCTION

This project is informed by design processes grounded in practices associated with experimentation and transformative design. It integrates what is known as experience design¹ into the fabric of space within the city, in a way which explores how participants are affected by space. My thesis research focused on design strategies intended to enhance user participation. Experience design offers a series of strategies through which the public might understand content on multiple levels: cognitive, emotional and physical. The experience designer attempts to not only craft a message, but also to anticipate and subsequently measure potential responses. This process leads to research based on experimental experience design cases, meaning that the work is deeply dependent on context, and takes an approach that attempts to embed theoretical studies within design practice.

The thesis project explores a number of more specific research questions:

- 1) Where and what is public space and is there a role for media design in public space?
- 2) How can we define the everyday, the quotidien?
- 3) How can we as designers activate the facades that delineate our urban space?
- 4) By offering interactivity, parts of the curation are handed over to the audience. Does this contribute to a deeper involvement from and among the users?
- 5) How does design intervention change a place and, in turn how does the place change the intervention? What is the process by which they inform each other?

APPROACH AND BACKGROUND

As much of the work finds itself connected to lived experiences and the subjective perspectives, it is difficult to distance myself as author from the research. As such it is important to take my own experiences into account in this paper. My background is in communication design, including graphic design, typography, and the moving image field. A focus on documentary film and animation has led me

¹ Experience Design, an approach to design that encompasses multiple senses and requirements and explores common characteristics in all media that make experiences successful, as well as related fields, Interaction Design and Information Design. Nathan Shedroff is chair of the ground-breaking MBA in Design Strategy at California College of the Arts and one of the pioneers in Experience Design.

to installation practices. My professional work experience in these particular fields often required the implementation of moving images in space within the context of branded environments. BMW-world, which employed a combination of space, media, and technology that pushed beyond a straightforward commercial design to a practice of redefining space, emotions and contemporary cultures, is one such branded environment. This experience shifted practices to which I had become accustomed, and focused my interest in alternative directions allowing me to consider architectural constructs that were not intended as showcase environments. This practice has allowed me to realize that I would like to specialize in experience design as part of my thesis studies focusing on non-commercial environments. My practice has always been dependent on technology, and during my thesis research, I made a concentrated effort to incorporate cutting-edge electronics and interactivity. Through academic and practice based research in this area, I became aware of a wide range of work that constitutes a fascinating convergence among people, technology and creative practices that include design, architecture and art in the creation of the built environment.

METHODOLOGY

The research methodology developed for this thesis is based on a practice-based exploration also known as research-through-design.^{2,3} It is carried out as a reflective design practice focused on design artefacts themselves and their use as a means to gain insight into the kinds of interactions emerging in a lived context. Pursuing this process, various design methods, theories, and tools were selected to structure and forecast the consequences of the interventions. The results were studied and analyzed based on their influence on everyday life in specific spatial contexts primarily using qualitative methods, including but not limited to observation, documentation, and serial-prints that logged activation and use patterns that could then be used in the analysis of patterns of engagement and use.

² Frayling, C.: Research in Art and Design. Royal College of Art Research Papers I (1993) 1-5

³ Zimmermann, J., Forlizzi, J., Evenson, S.: Research through design as a method for interaction design research in HCI. CHI 2007. ACM Press (2007) 493-502

This project has been influenced by the work of theorists Michel de Certeau, Bruno Latour, Gaston Bachelard, and Donald Schön. I also borrow from Nathan Shedroff, an expert in the field of experience design. Latour's concept that space acts upon the social rather than merely reflecting it is a guiding concept in the exploration of interventions into the built environment. Latour examines what is assembled under the concept of society by using actor-network-theory. His work *Reassembling the Social* is critical to my research. My project is interested in changing the dynamics of how public space is perceived, altering the perception and absorption of a given space by inserting informational content which is in turn affected by the nature of the space.

The larger thesis project is based on three design experiments carried out in separate physical contexts using different technologies. In each case, the experiments or interventions were evaluated in relation to how they changed an audience's perception of a space, and how the space itself changed the intervention.

Each experiment represents a different investigation in specific technologies and techniques that have led to the final thesis project. Techniques were borrowed from architecture, film, design, media and visual arts. Drawing on these techniques in the context of spatial and experience design, the technological components and narrative structure of my research are held together under the umbrella of the overarching question:

How can a given piece of content, when displayed publically in multiple contexts, use to its advantage the inherent material, technological, and social attributes of each space to create a more persuasive call to action?

Responses to this question are explored through praxis-based research that has allowed room for creative and unexpected inspirations. Hypothesizing that places accumulate meaning and significance through interaction, the research is directed at gaining a better understanding of both reading space and using space as a tool to design situations in order to inform the study and practice of design from a designers' perspective to the public.

PROJECT OVERVIEW

My research developed in a non-linear process through three design experiments.

1535 Installation—a public façade installation inspired by Rafael Lozano-Hemmer's⁴ work, specifically looking into format and large-scale projection. The spectator was the focal point for an examination of de Certeau's theory of everyday practice, with special attention to his text *Walking the City*. De Certeau believes that in our cities people walk with a kind of blindness, not seeing or recognizing things, by which he therefore concludes that they are not actually inhabiting the city at all.

1612 Installation—consisted of a public and semi-public part as the space was partitioned with a window-pane up front and a separate gallery space in the back. At the time the research began to take interest in the work of the office for subversive architecture and the theoretical approach of Anthony Dunne and Fiona Raby⁵ came into focus. Concerns regarding the placement of artefacts within a particular space, natural light, the merging of public and private, and the unexpected all came to the fore.

1399 Installation—the *Claustrophobic Object, Version I* was also influenced by the work of Dunne and Raby. It involved the creation of an interactive LED object that reacted to motion and proximity, thus shifting my research focus to interactivity and electronics and investigating participation and user involvement in the built environment. This experiment was also influenced by the theoretical work of Gaston Bachelard and his interest of emotional qualities of a space and the use of spatial tactics by the occupants of environments.



Fig. 1 Anja Braun, Collage of three experiments: *1535 Installation*, *1612 Installation*, and the *Claustrophobic Object, Version II*. 2010.

⁴ Rafael Lozano-Hemmer is a Mexican Canadian electronic artist who works with ideas from architecture, technological theatre and performance.

⁵ Anthony Dunne is professor and head of the Design Interactions department at the Royal College of Art in London where Fiona Raby also teaches. Both use design as a medium to stimulate discussion and debate amongst designers, industry and the public about social, cultural and ethical implications of existing and emerging technologies.

2 THEORY–BASED RESEARCH

2.1 MEDIA, SPACE AND THE EVERYDAY

By looking at space and the role of media through the lens of *la vie quotidienne* (de Certeau, 2002. Lefebvre, 1991), we might find objective ways to clarify what the role of media in public space might be. Media determines how we navigate public space through messages that permeate the urban environment. It exposes public and private ownership. For example brands that are projected onto the streets mark private corporate ownership in that space. This abundance of mediated messages creates a state of distraction, which affects our understanding of space. This cause and effect relationship between people and space is a primary concern in studies of *la vie quotidienne*. Henri Lefebvre defines it as the other of history (i.e.: things that are left out of official stories) and this research might also be seen as useful way into discussions about space and gender.

One role of media in public space is to persuade people. Public service announcements and corporate identities dominate the public arena, shouting a torrent of material at people moving through space. This leaves little room for cultural information. Top-level broadcast information overwhelms the environment. Invitations to engage with the city itself are few and far between. There are few instances where the city actually communicates with the people in a cultural way. One can look at the Vancouver Art Gallery (VAG) as one of the few examples. The institution of the VAG is presented as an invitation that pulls people into it; it allows visitors to be part of the fabric of the city. It is a different kind of communication with the city than billboards or brand signs.

Another objective of this research was the investigation into the realm of technology. Can we use interactive technologies to meaningfully change the relationship between people and the urban environment? Can we do so, not only by engaging people in the intervention, but also by handing over content generation to potentially build a stronger connection between the participant and the environment? This is dependent on the kind of interactions and engagement offered. An interactive object enhances the experience and changes behaviour on a personal level by responding and

interacting with an individual, whereas projection could only trigger thought for action in the masses at large. In essence the former is a conversation whereas the latter is a passive relationship.

In creating work that articulates public spaces and built environments specifically, this project questions the ability of technology to transform objects and spaces. It examines media design as a mode of communication in public spaces which makes use of technology but also incorporates the aesthetics of design. More specifically, it considers the way in which technology mediates an experience in a specific space and how moving imagery or other technological components like interactive LEDs can reveal the dynamic relationship between an active perceiver and the environment.

Media and the observer.

There are multiple modes of communication in the city and for the most part, inhabitants of the city become blind to them as they grow familiar with them, learning to subtract them from their awareness. The average message is visually loud, nervous, overwhelming, and distracting trying to seduce one to consume. This is an approach that is diametrically opposed to the approach of this project. This project attempts to inform people about contingent issues—other than commercial goods and services. The process is one of gaining the attention of the inhabitants of a city by applying a new theoretical and practical approach in marginalized public spaces, to facilitate mediation between the people and the space. Instead of being overwhelmingly loud with one's visual language, the intention is to create a visually engaging design with which participants may interact, fostering an idea of proximity by getting people involved in new and intriguing ways with existing and improvised elements within a given public space. This paper focuses on collective and individual experiences by stressing the idea of agency to allow its inhabitants to create an emotional or cultural connection with the space.

What else is at stake?

Public and private property of the city is inseparably connected to the media that is attached on top of buildings or façades. Gaston Bachelard's theory of spatial tactics and Michel de Certeau's every day practice and territoriality are theories that have aided in understanding how people may experience

public space. The theory of the everyday is particularly relevant here. Architecture is part of the everyday and shapes the experience of any city; it provides us with our most common experience of the space on a daily basis.

It is important to state that the concept of everyday life varies depending on individuals, groups and societies, as outlined in Ben Highmore's *the everyday life reader*. The everyday is based on cultural differences that cannot be generalized in one term or another. That is why when discussing the everyday or the everyday life, this text is referring to contemporary western social and cultural life.

By working with marginalized spaces that are critically examined through creative design practice I am problematising the notion of place. Working with these spaces can be challenging, as these places are often overlooked. One of my aims as a designer and cultural producer is to highlight the real existence of these places and shed some light on their actual and unrealized spatial potential.

Most of the spaces chosen for the research project are on the fringe, they are in a strange flux without any connection to the fabric of the city. We can see them as a canvas and opportunity to create this missing connection—an identity and some kind of belonging. A place comes into existence by being mediated or making something appear within what is present. Living the everyday and establishing a notion of dwelling in both real space and in virtual space is then left to somebody else to complete—namely the public.

Walking is one of the elementary forms of experiencing a city, it does something to us, to our perception, even when one does not recognize it. Planners, for example give areas names in an attempt to make them significant in discourse, however, walkers and users take over these areas, allowing a poetic geography to emerge on top of the objective one. Official names and plans are therefore taken over by new signifiers as de Certeau describes in *Walking the City*. But city-dwellers are distracted most of the time, resistant to what is trying to influence their behaviour. Most of the time urban inhabitants are locked in a state that could be called continuous partial attention, attempting to resist what is projected on them on a daily basis. This is when the idea of inhabiting

the city and creating a place for dwelling comes into play. Paraphrasing Heidegger, the concept of dwelling carries with it a productive quality, and active engagement with one's environment. Simply taking shelter, as he reminds us, is not dwelling (Heidegger, 2001, pp.145–161). Part of this research is to test the idea of urban interventions, creating a place to connect with the fabric of the city and other spectators by getting immersed in interactive processes. Instead of being distracted with commercial information, this project seeks to build a connection between the citizens and the community by involving them in culturally relevant issues. Relevance is defined as being able to see a connection to their own life and behaviour (e.g. local water consumption) for example.

This theory of *la vie quotidienne* does not only apply when reading the space as a place for interventions but also to the transformation of the space for user involvement. Hence, if reading the everyday shows how people are distracted and are trying to resist commercial mediation, then, how is this relationship inverted? This project proposes that playing with the idea of the unexpected, provoking curiosity is a method to get people engaged. By mediating public space this research seeks to change the perception of a particular environment within its context, by using it for something for which it was not intended and by letting people engage in communicating with the city.

2.1.1 CURATING SPACE

In this project, the space is first read and then specific technology is chosen what works within that specific space. The considerations are: 1/ proximity of people to the installation, 2/ spectator interaction with the installation, and 3/ scale of these interactions. This means that my use of technology was dependent on the particularities of a given space. Reading a space and seeing what is left out of this specific space as a problem—but also as a possibility—is a chance to bridge the gap between a space and the city by generating an identity for the space, so that the fabric of that space is established first. According to Tim Gough the idea of curating the city takes place by mediating a public space (Gough, 2009). By operating within and with that space, citizens are given

a chance to inhabit that space and give it their curatorial attention. By doing so, they extend the work of the designer, completing the legibility of the space with multiple personal narratives. Places are still in a state of becoming, which can be directed through urban interventions realized as works of design and art. Theorist Marc Augé has argued for a broadening of our intellectual stance and range of media for engaging with the phenomenon of the modern metropolis. Approaching the city as a collection to be curated opens new possibilities to explore and enrich the urban condition as a whole; it can reveal unexpected aspects of space and new ways of inhabiting it. Sarah Chaplin and Alexandra Stara state: "[T]he contemporary city is a hybrid structure in a constant state of becoming through multiple interventions, conflicting intentions and mere chance, highly resistant to totalizing analyses and narratives." (Chaplin, Stara, 2009). The content of an installation does not only lie in its use of media or the story it tells; it lies also in the place it activates and changes. My work is an invitation for critical engagement through making that is pushing design for public spaces into a more critical context and thereby influencing people in an intelligent way; it allows them to take part in the design cultural process instead of just seeing them as the consumer of the end product.

Revealing ambiguous and latent layers remains essential in order to understand a public space's potential and to have any measure of success in further interventions. This is a key challenge in contemporary urbanism, which calls for devising alternative ways of reading and intervening in the urban fabric. These could be creative interventions through interpreting and, conversely, invitations to critical engagement through making. Interpreting public space and cultural heritage, rethinking curatorship and architecture is necessary to challenge perceptions and spatialised narratives. The role of (interactive) media is a curatorial overlay in which movement and vision are interconnected in terms of cognitive understanding of place. Taking a broad philosophical look at the curation of public space and paying particular attention to the roles of virtuality and materiality are intended to provoke revisions in our thinking about the implicit relationships between curatorship and built environment. Bespoke installations in existing spaces are one option to approaching this because they help focus on an interplay between space and concept.

According to Chaplin and Stara the questions that face us about the future of the built environment become more pressing through curation: “the business of curating architecture and the city is, and should be, messy and contingent, full of endless questions, contradictions and, most importantly, opportunities to engage directly with spaces, places, people and their ideas” (p. 5). This calls for exploring public space as a realm where broadly defined curatorial sensibility can offer new insights and enrich everyday experience. The cultural and social is necessarily inscribed in the architectural and vice versa. By building an unrestricted, relationship-oriented culture that encourages interactivity and communication along with a creative questioning of the status quo, architecture can come to life in unexpected ways. The built environment must be understood in its symbolic and operational dimensions as a catalyst promoting social relationships.

2.1.2 EXPERIENCE DESIGN

According to Nathan Shedroff you can think of an experience in terms of an attraction, an engagement, and a conclusion. Observational experience can trigger the audience to participate in action. This is dependent on how the design object is understood in the minds of the audience. For example, a direct response between the object and the user makes the object understandable. To be effective, usability principles should always be verified with user testing. It is important not to lead the users through the test; in order to interpret the results objectively they need to explore it by themselves. Users also interact with experiences in different ways. With real-time situations, people controlling the experience can usually see how many people are present, if they are engaged, how they are interacting, and whether or not they understand the experience. If we want these experiences to have lasting impact it is important to design them so that audiences or participants can find meaning in them by making connections to their own lives and values (i.e.: human characteristics in the behaviour of an LED object). A successful or memorable experience is one that transforms us or makes us feel something. Sense-making is essential for an experience that should trigger some kind of affect.

These observations suggest ways to identify opportunities given by the city and its environment to engage people and build connections to the fabric of the city. This starts by reading and understanding space and figuring out what technology to use to let this place come to life, and how to interact with the materials. In short, curating space means: to read, understand, interpret, choose, and use (place and arrange technology within) what is given—the built environment. After looking at built environments and experience design in general, my research concurs with the conclusion that interactivity is one of the catalyzing elements of experience design in combination with architectural research⁶. Interactivity places at its centre the subject instead of the object and incorporates a fundamental feature of computer systems which is the possibility of creating interconnected, changeable models of information that can be constantly reconfigured. Interactive opportunities and a more satisfying experience can be increased if we endow the design object not only with the capacity to affect the audience but also with the capacity to be affected by it. This could be reflected by putting humans into dynamic play, by making their presence or absence trigger these patterns.

⁶ Lucy Bullivant, 4D space: Interactive Architecture

2.3 CASE STUDIES

The following three case studies show various applications of the concepts and concerns of this thesis. These studies look at the work of Rafael Lozano-Hemmer, Greyworld and the office for subversive architecture—each of which borrow, like I do, techniques from different practices, without sticking to a single medium. They employ a combination of video, animation, architecture, light and interactivity merged together in a collaborative work environment across disciplines.

2.3.1 RAFAEL LOZANO-HEMMER

Rafael Lozano-Hemmer creates large-scale public works that often involve people who do not consider themselves consumers of arts and culture or who were not involved with the arts until being exposed to his work. This social notion represents exactly one of the researched approaches to urban interventions in the everyday.



Fig. 2 Rafael Lozano-Hemmer, *Body Movies*, 2001. Cultural Capital of Europe Festival, V2 Grounding, Rotterdam, Netherlands. Used by permission of the artist.

Lozano–Hemmers’ public interventions give a clear sense of how the arts feed and improve our communities and economies on an ongoing basis. He deals with social expressivity and moments of interruption in the way that we interpret the city. Lozano–Hemmer often realizes projects that allow people in different parts of the world to participate via internet, or locally he uses sensors that humans can interact with on the spot. In many pieces, like *Body Movies*, he lets his audience ‘take over’ those kinds of technologies—he is handing over parts of the curation to the public. *Body Movies* is evidence of his strong focus on participation-oriented projects; it is a very celebratory large-scale projection piece that creates a little bit of an interruption in the normal pace of the everyday.

In *Body Movies* Lozano–Hemmer uses media façades as a subcategory of urban computing, the project research revolves around coming to grips with sense-making and social mediation as part of identifying key characteristics of interaction with media façades in an urban setting.

2.3.2 OFFICE FOR SUBVERSIVE ARCHITECTURE

The *office for subversive architecture* (osa) is a collaboration between designers, architects and artists. Their projects focus on the reinterpretation of public space. Explorations into the notion of the fabric of the city, the projects read as an ongoing curatorial project and argue for a readjustment of our attitudes to the complexities of the contemporary city.

Reading the city and using the building as a canvas or as a tool to create an ongoing relationship with the metropolis are ideas central to osa’s projects as well as to my own. They believe, as I do, that the work should issue an invitation for engagement, for action. Responsiveness to site lies at the foundation of osa’s work, neither ‘construction’ as imposition nor ‘destruction’ as reduction is taking place, instead, their interventions reciprocate with given place to begin unravelling and revealing the other possible places to be found there, looking for the hidden intrigue of each site. Curator and writer Alexandra Stara states that “they are a proposition for an alternative stance to urbanism that

operates through drawing attention to neglected aspects and possibilities of the city instead of imposing a 'vision'." (Curating Architecture and the City, 2009).

In the case of *osa's Accumulator Project* the installation work transforms a former swimming pool into a virtual water collector. However, at the same time it symbolizes an emotional charge of an important public space in the city. *osa* is looking at the history or memory of a place to then build a connection with that in mind. With respect to this project specifically, there is this kind of engagement with the building on a temporary level as it is about to be taken down.

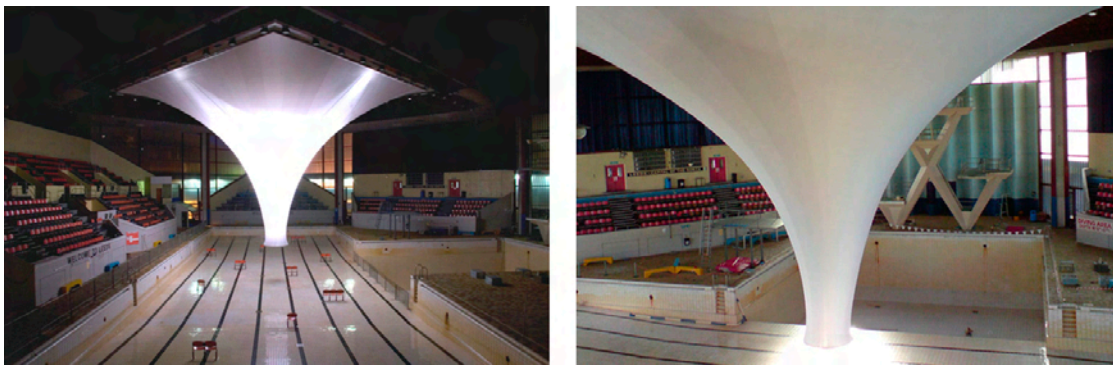


Fig. 3 office for subversive architecture, *The Accumulator Project*, 2008. Installation at Leeds International Swimming Pool. Photo: Philip Day. Used by permission of *osa*.

Fig. 4 office for subversive architecture, *The Accumulator Project*, 2008. Installation at Leeds International Swimming Pool. Photo: *osa*. Used by permission of *osa*.

This perceptive work brings design to the masses and helps us to rediscover our everyday surroundings. It challenges us to question if the cities we have are the cities we need while adding a touch of magic to everyday places and situations. *osa's* work is relevant to the projects research approach in general and could be linked to each individual iteration of the thesis work.

2.3.3 GREYWORLD

The Source by Greyworld was designed for the London Stock Exchange atrium. An eight storey high kinetic interactive sculpture that provides a form of expression within the urban landscape, it is a

physical manifestation of data, and therefore a form of information design. *The Source* is formed from a grid of cables arranged in a square with nine spheres on each cable, acting like animated pixels. This generates an infinite range of figurative and abstract formations that rise and reform at different heights creating any shape in the three dimensional space.



Fig. 5 Andrew Shoben and Greyworld, *The Source*, 2004. Installation at the London Stock Exchange. Used by permission of Andrew Shoben.

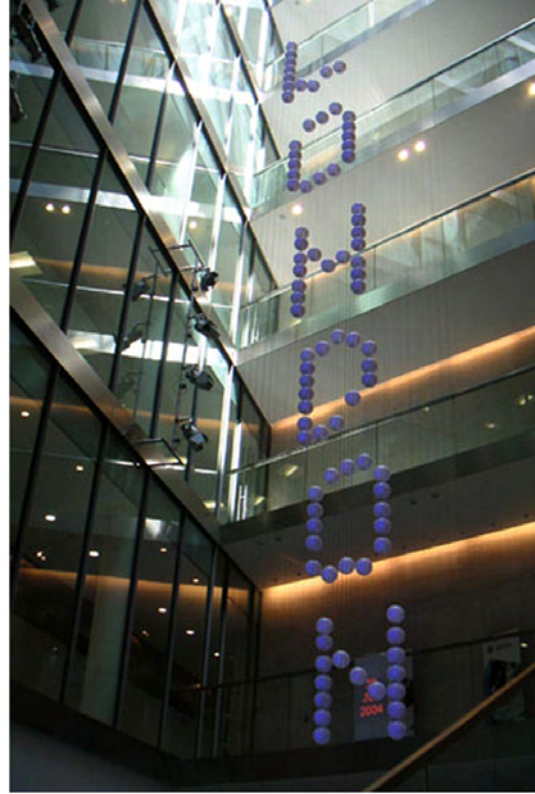


Fig. 6 Andrew Shoben and Greyworld, *The Source*, 2004. Installation at the London Stock Exchange. Used by permission of Andrew Shoben.

This interactive object involves the work of Andrew Shoben, who is according to Thomas H. Dykes⁷ a hybrid practitioner who creates interactive sculptures designed to provide a form of expression within the urban landscape. Shoben amalgamates various disciplinary perspectives

⁷ Dykes, Thomas H., Rodgers, Paul A., Smyth, Michael (2009) Towards a new disciplinary framework for contemporary creative design practice, *CoDesign*, 5:2, 99-116

through transdisciplinary design⁸. One of the main similarities between his work and the project is that he brings together diverse disciplinary concepts to focus upon a context, such as urban intervention, while exploring new questions. Shoben states that his aim was to “articulate public spaces, allowing some form of self-expression in areas of the city that people can see every day but would normally exclude and ignore”⁹. This statement firms the projects’ approach to articulate and mediate intriguing spaces that are usually overlooked by the public combining different disciplinary perspectives like architecture, computing, sculpture, product and communication design. It is also one of the main reasons why my research took a step into the fields of interactivity and electronics.

2.4 SUMMARY

Each of the artists and collectives discussed has a different perspective and their works relate to and inform the technological and theoretical aspects of the research project, primarily regarding spatial politics, technological aspects, and user engagement. Looking at them allows one to use an understanding of technology and mediums locating each case study uniquely in the realm of public art and installation. The research can look at them critically and find that one is interesting technologically like *The Source* by Greyworld one or examine others like Lozano–Hemmer’s piece with its theory of user engaging environments and motion video. All of them use similar approaches for communicating ideas, visualizing information, telling stories, and using those techniques for different purposes. All of these projects are informed by the theories of the everyday, social space and urban environments. Each case study has influenced my work in a different way, from Lozano–Hemmer’s use of technology to foster public interaction, and osa’s poetic revelation of hidden historical narratives to Greyworld’s physical manifestation of the space’s emotional connection to largely abstract information. In each case the goal is to identify techniques that can be reapplied to communicate an idea.

⁸ Transdisciplinary design involves knowledge or concepts from at least two disciplines, none of which is predominant (Stein 2007).

⁹ Aitch, I., 2005. Power to the people. *Landscape Journal*, December.

3 RESEARCH APPROACH AND PRACTICE

3.1 METHODOLOGY

Technology and design share a common concern for generating artefacts that are intended to transform a situation from what it is to something better; both are concerned with intervention, innovation and change. One of the major goals for the MAA¹⁰ was that the researcher could engage in research in design-making that would contribute directly to an on-going practice, in a way that would not suspend the creative work or allow it to become separate from the research activity. Hence, my work is based on practice-based research methods. The created artefacts (*1535 Installation*, *1612 Installation*, *Claustrophobic Object, Version I and II*) are more than just by-products or examples of *know-how*, rather they are outcomes, objects of value, as the research was focused on producing work that will stand in its own right.

Donald Schön (1983) describes how practice is an exploration in which the practitioner seeks to come to terms with a given creative task. This exploration involves the formulation and testing of ways of proceeding, which echoes the research procedure for each experiment. Generally, all thinking in this activity is directed toward action. After finishing a project or even during its process, whenever there is a break, one reflects on the current project, the approach taken to it, and on influences and its relation to past projects (cf., Figure 7, reflection-on-action and -practice, ROAP). The main difference between reflection-in-action and -practice (RIAP) and reflection-on-action and -practice is, that the latter is not driven by the unexpected but by the desire to learn from experience: it is a discipline rather than a necessity for further action. Schön states that reflection is central both to the practitioner's ability to successfully complete projects and to their professional development.

These reflections may change the researcher or even the project both consciously and unconsciously. Schön sees reflection as the primary cognitive mechanism for dealing with the unexpected and, through the resolution of the unexpected, for learning.

¹⁰ Masters of Applied Arts graduate program.

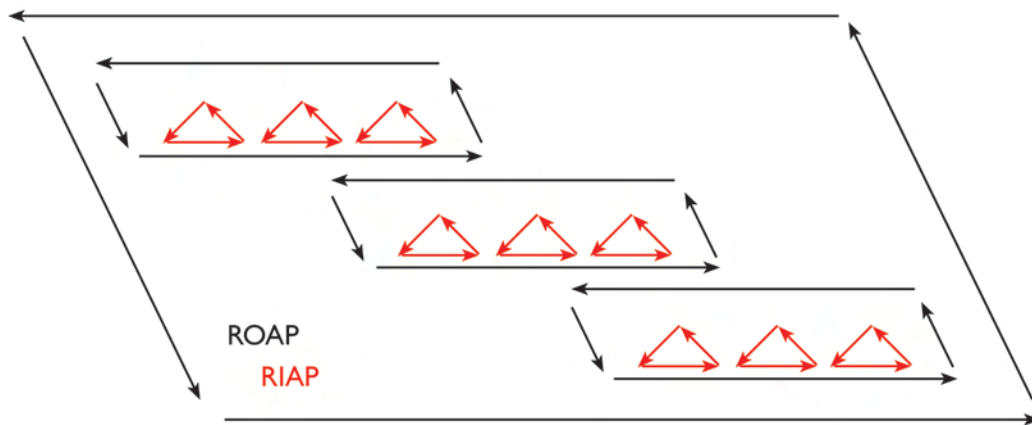


Fig. 7 Anja Braun, methodology/process chart.

After planning, systematic development and the creative production the finished medium goes through a process of adaptation for the given space which then leads to on-the-spot experimentation. The following observation and reflection, recording and reporting of the reflection, and the consequences (intended and unintended) and responses to them play a crucial role in making the whole creative production more accessible to the researcher and to those whom the project is communicated. The record of creative-production is the starting point for its documentation. This will provide the material for reflection on action and practice. Then, given a record of creative production, reflection on action and practice amounts to reflection on a description of creative-production. As this would end in an extensive description my focus is directed on moments of reflection-in-action and-practice. As I will show in the descriptions of the three design experiments, each allowed for a period of reflection after its completion which generated a deeper understanding of outcomes in the context of the other experiments.

The research recognized that its interests, intentions, and ways of working, although concerned with the creation of artefacts, cannot be moulded into a problem-solving project and that to do so would be a failure of imagination. A practice-based approach was conducted because it is inventive and imaginative, and realized through and in artefacts.

3.2 EXPERIMENTAL EXPERIENCE DESIGN CASES

My research developed a series of three separate experiments in lead up to the final project: *1535 Installation*, *1612 Installation*, and *Claustrophobic Object Version I and II*. Each provided separate explorations into technology, techniques and different aspects of practice.

3.2.1 1535 INSTALLATION

1535 is the address of an ordinary two-level office building that housed the MAA design studio, and was the site for the first design experiment. The experiment was based on the use of four large window-panes which served as a projection medium. The project was constrained by the size of the separating wall space, and the availability of large format projectors for a space measuring 20m x 1,80m. The untypical landscape format provided many opportunities to handle the images in either four channels or one large channel.



Fig. 8 Anja Braun, *1535 Installation*, 2010. Rear-projected animation.

The content for the experiment consisted of excerpts of a one channel video piece about human rights violation that was originally created for a previous project in 2009 in Saarbrücken, Germany. Unlike the original version, there was no sound linked to the scenes that could reinforce imagery or content. Nonetheless, narration was enhanced by the controversial assembly of the four scenes. These were running simultaneously in the four panes, separated into selected channels or projected together as one. The dialogue between images exposed a critique, but interpretation was required to read the provocative message. The whole project could be seen as information design as well as critical design intervention.

From a research perspective, the window façade intervention *I535 Installation* was focused on the reinterpretation of public space with a focus on the local passers-by and was intended to be an exploration for facilitating social interactions by manipulating a façade with the motivation of transforming the perception of the building in the eyes of the public. The open nature of the setting for the installation and its integration into the existing architectural structure created certain challenges in the design process. The created animation was adapted for the building as illustrated in Figure 8 and acted as a complementary aspect of the building itself.

The experiential qualities of technological inquiry, the development of the façade projection, and the numerous possibilities of different viewpoints and perspectives in the larger environment framed the experience of the place. First, it served to connect the surrounding population with the place—pedestrians and cyclists, both on the bridge and in the streets, as well as those in public transportation or cars—forming a new connection between different locations that had been disjointed beforehand. Second, it altered the perception of the façade of the building; and third, it caused a shift in general understanding of the character and image of the space in general and of that building in particular, thus imposing a cultural aspect on a place that beforehand was culturally unimportant. The social mediation evoked by this installation was the most important feature of the project.

The research consisted of experimenting with large-scale projection in a technological and conceptual way, investigating through this technique the idea of distance, time exposure and speed with regards to the perception of three different persona—a pedestrian, cyclist and car driver. By observing the environment and making a study related to the three personas, position and time exposure the research was testing a method exploring different types of techniques. The findings in turn influenced the handling of the channels as each persona, depending on position and speed, required different factors of the projection—like scale, pacing or the activation of one or four channels, etc. Within this investigation, the research was in the material, creating knowledge about space, light, positions, media and techniques, and by seeing the building itself as a canvas turned it into a form of media, a supporter of content. Even though it was supposed to be a public façade installation for the outer world, another one was automatically created indoors with a completely different atmosphere. The vast empty clean room containing only four plinths with four projectors was bathed in a warm red light as the street lamp turned the bluish light from the projection itself into a warm glow.

3.2.2 I612 INSTALLATION

The *I612 Installation* took place in the I612 Gallery and its front window from March, 25th to April, 1st 2010. This experiment investigated the responsiveness to site. According to Helgi Kristinsson I612 Gallery does not have the aesthetics of the white cube although it has the elements that will constitute it being a gallery.¹¹ Because the space was adapted from a previous industrial use, it lacks the neutrality that a white cube would project. Starting with the experience of the space and working with the idea of knowledge transfer, the project explores the relation of content to the interior and exterior components of the space. The gallery space was ideal for such a task as it was already divided into two sections: its interior and a separated showcase facing the street, linking to the outer world. It is not a public space per se but projects outward to the sidewalk space. This is a common practice attempting to engage the public through its façade.

¹¹ Artist Helgi Kristinsson, creator and curator of I612 Gallery.

One of the self-imposed requirements was to display the work during both day and night, a technical challenge due to limitations of different media. The articulation of the liminal space was of interest; how the content modifies the perception of the public environment by creating experiences that provoke a change in social acting. The approach to this space was with strong interest in how the perception of different public environments can be changed with the same content presented in each. At the I612 Gallery I used the same content that was used for the *I535 Installation* split up in two localities. By splitting the content between the front window and the interior the audience was not able to see it all at once. A full understanding of the installation would therefore only unfold over time.

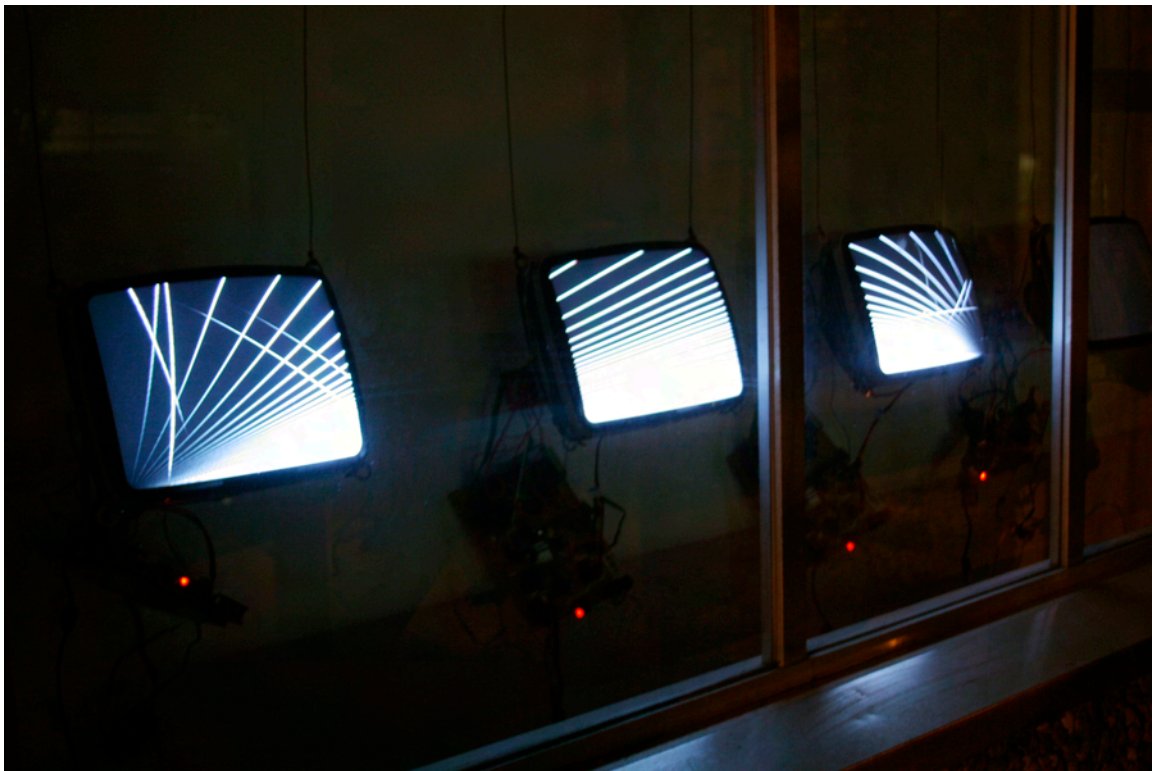


Fig. 9 Anja Braun, *I612 Installation*, 2010. Mixed media.

The four TV screens were suspended in the gallery's showcase front window, an unconventional way of presenting the screens. Using the unexpected to engage in what has been offered, the passer-by turned into an audience. The spaces between the monitors insistently fragmented the

flow of images, underscoring the sense of dislocation. Soundless visuals in four channels were shown. Most of them found their way into the gallery where a second installation was awaiting them with the same visual content in one channel instead of four with the addition of synchronized sound. Passers-by were following the same behavioural patterns: passing by, stopping, watching, coming closer, wondering and searching for more. Realizing that there suddenly is more, looking for an entrance, and entering the space to engage in a second experience.

Referring back to Shedroff, attraction is necessary to initiate the experience. It can be cognitive, visual, auditory, or a signal to any of our senses. One can refer at this point to the TV screens in the window that were to catch peoples attention to recognize the hidden gallery. The engagement is the experience itself. It needs to be sufficiently different than the surrounding environment to hold the attention of the person, as well as cognitively important enough for someone to continue experiencing it (e.g. the visual appearance of the stripped TV screens). The conclusion can come in many ways, but it must provide some sort of resolution, whether through meaning –story or context– or activity, to make an otherwise enjoyable experience more than satisfactory.

3.2.3 I 399 INSTALLATION

I 399 Installation took place during *Spurious*, the Masters first year show, at Emily Carr University from September, 22nd to October, 3rd, 2010. The work was installed in a dark and small but un-proportionally high ceilinged room without any natural light. The room is situated inside of the institutional building. Its entire front consists of a window-pane and door leading to a wide corridor.

The *Claustrophobic Object, Version I* is an interactive LED object that recognizes peoples' presence by reacting to their behaviour in ways that encourages the user to realize his or her own agency. The experiment investigated how users would react to a technological object showing human characteristics. The project was specifically interested in the question of whether users would respect the implied private space of the object, how they would interact, and what new interdependencies and relationships might emerge.

The *Claustrophobic Object, Version I* installation is based on sensors that are constantly scanning the environment. The object has a programmed autonomous behaviour. Visitors become easily encouraged to find out more about the working and behaviour of the installation and the nature of the object that appears to have a life of its own. Users quickly discover that the mode of the object is dependent on their action and position. Once a person starts moving or changing position, approaching the object closer, it shows a new behaviour. Its brightness and speed of blinking instantly starts to change.



Fig. 10 Anja Braun, *I 399 Installation, Claustrophobic Object, Version I*, 2010. LEDs and electronics.

I 399 Installation is a means of exploring the overarching research question. This experiment contributes to the understanding of spatial interaction, sense-making, and social mediation as part of identifying key characteristics of interaction with technological objects. The research addresses in particular the open-ended nature of interaction, which produces a variety of interpretations by the audience, and enables individual sense-making. Moreover, the experiment contributes to the

understanding of interaction in a setting that is both public and private (the gallery space) which allows for observation of the effects of distributed attention, shared focus, dialogue and collective action, while providing multiple viewing and action positions.

As Shedroff suggests, many real-space experiences require participation in order to be successful. These are often the most satisfying experiences for us. In a way we could say that the audience leaves behind artefacts of their own participation, with respect to the *Claustrophobic Object* it would be the glow and even the serial-print could be an evaluation of the audience's understanding and interaction.

From a research perspective, the *Claustrophobic Object*, was meant to spark a discussion about how we relate and interact to our objects and if we respect them in our surroundings. The politics of power take shape and the vulnerability of the object stands to the fore. The installation furthermore represents an interactive artefact and environment that utilizes the tension between what is hidden and has to be discovered, the unexpected and what is revealed, fostering engagement through curiosity and inquiry. By giving a glimpse or an idea of what might happen (i.e. the animated glow) the subject's curiosity is piqued, offering ways of further explorations of visual and bodily engagement. The installation relies on the user's imagination to form an hypotheses about what is hinted at, that is to say the message, or content, is not explicitly present in the artefact. The biggest challenge therefore concerns the staging of a situation that is indeterminate, and the confidence that it is still significant enough, worth engaging in and an enhancement to the audience's understanding when presented in conjunction with more explicit content.

3.2.4 1612 INSTALLATION II – THE CLAUSTROPHOBIC OBJECT, VERSION II

One of the outcomes of the first iteration of the *Claustrophobic Object* was that it did not communicate clearly enough. Because the prototype left room for further development, the first version was re-worked and installed again in a group-show at 1612 Gallery as *Claustrophobic Object, Version II* (Fig. 11). This time the 1000 LEDs were suspended from the ceiling creating a ring of lights instead of being

positioned on the floor. Again user behaviour was my focus. This time the object offered even more active interaction: First, due to improvements to the coding, the object itself responded in a more direct and clear manner; and second, the spectator was able to walk into the object, which meant a clear separation of the active zones resulting in a better user understanding of the interactive process.

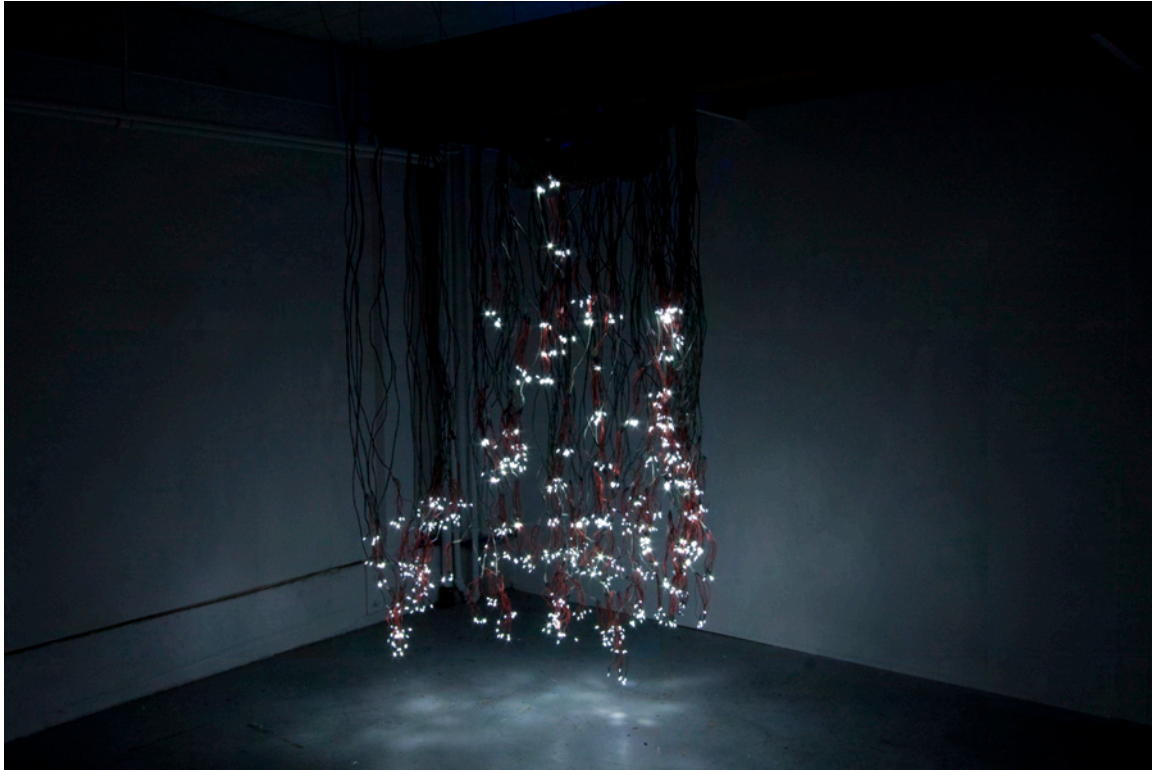


Fig. 11 Anja Braun, *I 6 I 2 Installation II, Claustrophobic Object, Version II*, 2010. LEDs and electronics.

Observational research suggests that one of the reasons for the success of the project was that it struck a balance between framing and open-endedness, in the sense that it evoked a number of different interpretations and interactions. Although the installation was of course developed to a certain range of potential inputs, it did not prescribe a specific behaviour among users. Some people responded to the basic functionality due to technical curiosity, some sought to make sense of the object's behaviour, and others explored the potential for social encounters and interactions, and yet others seemed most fascinated by the play, interaction and tactility the installation was offering. Observing this, one has to point out that most people would go through more than one of those scenarios.

On a concrete level, users could interact with what at first glance appeared to be a very alien intrusion into the space and through bodily interaction move forward with an understanding of this new situation coupled with sense-making of the interactive components of the object. As I found during observations and dialogues with visitors, this also sparked reflections and discussions about the role of interactive technologies in this setting, as well as in urban spaces in general. Hence this might influence people in the sense of causing others to engage with and reflect upon the role of share interactive technologies in the city.

3.2.5 ANALYSIS AND FINDINGS

Each project allowed for the development of new technological skills, techniques and knowledge. They each allowed for participation and interaction, but also for the use of different types of non-verbal communication, such as music, moving images, and exchange with other engaged users or whole user groups. The notion of performance played a major role in all three interventions—performance in the sense of the simultaneous act of interacting, perceiving and performing that a user carries out when engaging in interactive situations and the consequences that these interrelated acts have for the experience of interaction. By observing the audiences, their social and interactive behaviour, and communication with other users the research can confirm that by offering interactivity and handing over parts of the curation, more people engage in social experiences and interaction among random people takes place, by sharing a ludic or spontaneously playful experience.

PIECE	MATERIALS	FORM	LOCATION	SITUATION	CONTENT	INTERACTION	VALUES	PERCEPTION
1535	large scale semi transparent rear projection	elongated irregular	façade	passers-by, random car driver cyclist pedestrians	human rights space	façade	eye-catching knowledge mediation, makes space recogniz- able	unexpected
1612	rear projection rct screens	irregular and spatial	gallery space with windowpane	passers-by, random visitors random audience	human rights space	gallery space with windowpane	eye-catching social	unexpected expected
1399	LEDs	spatial	darkroom (gallery)	visitors passers-by special audience	human values power space	sensors infrared distance movement	playful responding social integration	unexpected, expected
1612	LEDs	spatial	gallery space	special audience with expectations	human values power space	sensors infrared distance movement	playful responding social integration	expected

Table I Anja Braun, chart: experiments comparison.

LIMITATIONS:

Considering that this quartet of projects was an experimental and experiential trial, several limitations were considered from the very beginning: technology, time, availability of public spaces, communication and costs.

1. Technology: The technological component has been a complex one as working with a variety of technologies. Finding bugs in the code, along with power source issues, the destruction by users, and a theft-proof set-up of the technology have been problematic.

2. Time: Time to organize spaces or technological components, and finish pieces was a key issue, as was the time of the day, because of light and reflection issues. Some pieces required darkness and functioned only after sunset.

3. Availability and access of spaces: Restrictions, access and availability of public spaces were a huge issue. Even within Emily Carr it was almost impossible to realize a project due to permission processes. In the public there were even more hurdles to clear: permission, insurance, and security issues were some of the most limiting.

4. Costs: Funding, costs for technological components and rental equipment have played a large role in setting the scope of the projects.

FINDINGS:

The findings out of those three experiments led to the following statements:

- alongside the formal and technical qualities of a building there is always an emotional connection between the space and the public due to personal experiences and memories
- the process of interpreting space and creating interventions can be left open, and invite a critical engagement by the public in the form of contributing to the content

- experimental strategies create unique and profoundly moving ways of occupying space as a socially interactive medium

Within the experiments there is a strong focus on the technological side to:

- develop spatial design skills and adapt the application of digital technologies to aid interaction
- understand technology as a tool for exchange cohesion and communication
- explore interaction as a way to encourage us to leave our isolated self and participate with a social group
- use digital technologies in combination with architectural space to create new dimensions

My research project examined architecture and the built environment and how together they present a platform to create identity, meaning and knowledge transfer by using building and sites as tools for mediation. Everyday life lies at the foundation of all these experiments which in some way relate to spatial politics. Space, whether explicitly or not, guides the nature of the interaction. Furthermore, the experiments contributed to the understanding of situational decision making flexibility by addressing urban interaction in relation to the condition of distributed attention, shared focus, dialogue, and collective action. Also, the research elaborated on the challenges for interaction designers encountered in complex spatial settings, which call for the need to take into account multiple viewing and interaction positions. Space and time allowed me to build an argument around three complex, unique cases from which one can compare and generalize.

4 THE FINAL THESIS PROJECT

4.1 THE WATER PROJECT

The Water Project began by searching for potential spaces in the city, by observing the space of the chosen location and gathering photo material as a way of understanding the needs of the possible audience. This was followed by defining personas, and building a series of scenarios grounded in the previous findings which also provided a set of tools to help put forward further design tasks and technological features to investigate. This particular round of spatial studies provided a general understanding of how audiences may address and understand the space, and what kind of interactive possibilities existed or needed to be enhanced.

Subsequently, I gathered and analyzed the material I had collected thus far and tried to extract themes with the most potential to act as reagents for building scenarios. This process attempted to bring together relevant information from the project for building a common understanding of what the installation would be, which technology would work best, and how and to whom it would communicate with and in which way. Scenarios also act as reference material for the peer groups involved in the project and as tools of *reflection in action* (Schön, 1983: 165). They aid in identify elements of the envisioned system and the way these elements translate social features. Generating a series of scenarios (see appendix II) also helped in keeping the holistic view of the envisioned system, various personas, and their differing needs as well as the different possible modes of interactions.

4.1.1 PROJECT BRIEF

The main focus of the project is to examine ways of using multiple media—projections, interactive design and built space—to communicate with the public. The content of the proposed work involves raising awareness of the issues around the city's use of water.

Located in downtown Vancouver, this installation is designed to transform a glass enclosed pedestrian bridge that spans Dunsmuir Street and connects a shopping mall with a high-end retail store.

The inside and the outside are potential mediators and connect the external passers-by with those crossing the bridge inside. The location has potential for great exposure as it is highly trafficked by pedestrians, cyclists and two lanes of car traffic.

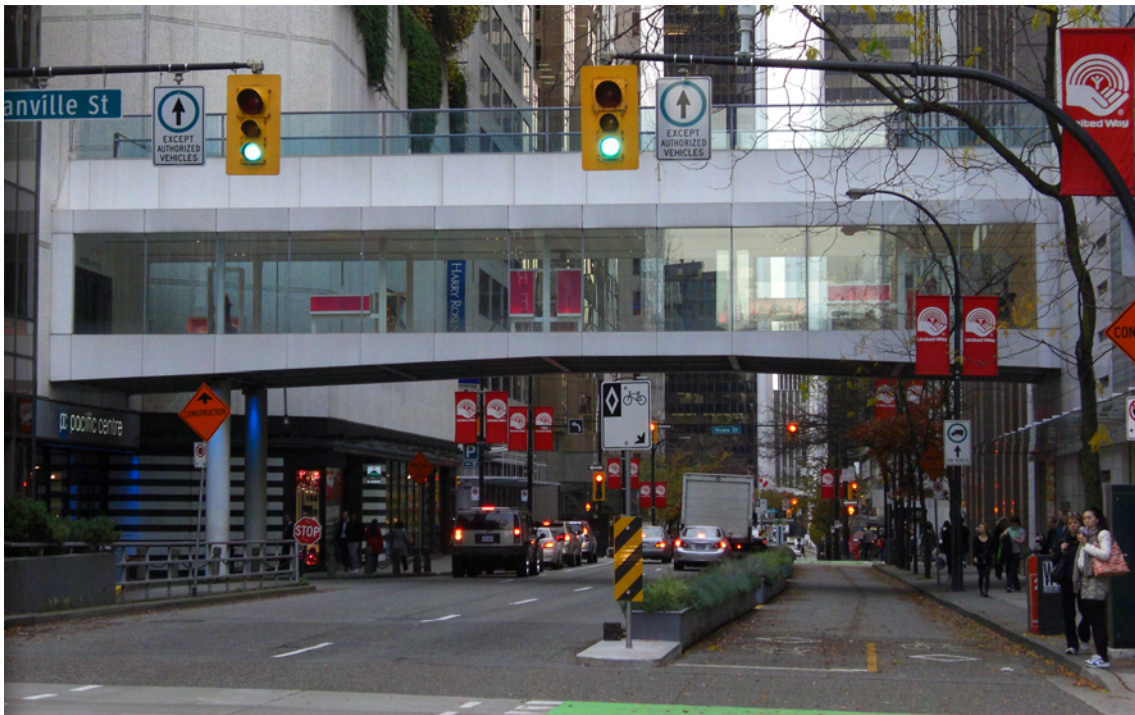


Fig. 12 Anja Braun, *The Water Project*, 2011. Glass enclosed pedestrian bridge.

This space has the potential for different scales of interaction, which attempt to give people agency within the city, and the ability to affect their experience. The pedestrian walkway has a natural way of communicating with the city. I mentioned at the beginning of this essay that walking does something to us, to our perception, even when we don't recognize it. This intervention pushes the notion of walking as a key means of experiencing the city.

This project again uses techniques and tactics borrowed from design, architecture and new media. The space and the architecture are taken into consideration as a canvas, with specific attention paid to the façade of the glass enclosed pedestrian bridge, which could serve as projection medium. This links back to Lozano–Hemmer’s work and the knowledge produced by the first experiment in the handling of the window-panes as canvases for large-scale projections. Proposed technologies for the responsive environment include projection media for the large-scale animation visualizing the issues of water consumption of the region. The visualization is constantly changing based on the feed of live data. This form of interactivity receives input from the real world via internet and its output devices are in form of actuators—mechanisms that transform the electrical input signal into motion. However, inside there are supplementary screens installed in showcases providing more detailed information about different kinds of water consumption.



Fig. 13 Anja Braun, *The Water Project*, 2011. Glass enclosed pedestrian bridge. Mock-up.

The installation has another real time element besides the live data feed of different water flows. When people are crossing the bridge indoors, webcams are capturing their movement converting

what is seen into a second flow, which changes the visualization projected onto the bridge's façade: silhouettes appear on top of the large scale projection as affecting the landscape attempting to represent the connection between humans and the water issue, as a metaphor for peoples' impact. Additional interactive components in form of infra-red distance sensors are placed inside the bridge constantly scanning the proximity to the screens. As some people approach closer the silhouettes on the large-scale projection increase in size and change colour depending on the user's distance. The content is split up in different sections: the large-scale projection presents live data about the water flow from the city of Vancouver and its environs in an aesthetic way, the generated imagery changes depending on the data via *processing*.¹²

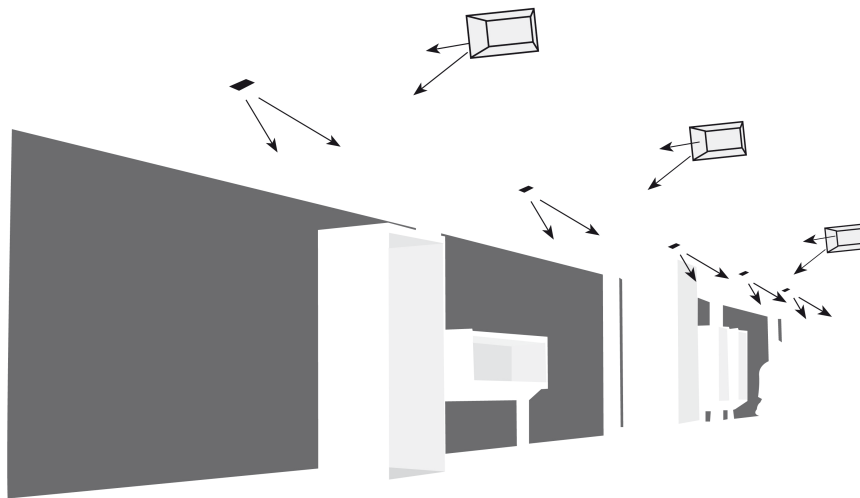


Fig. 14 Anja Braun, *The Water Project*, 2011. Scenario mock-up: inside the bridge.

The use of the live data can be understood as the following:

On top of the actual map of the region a virtual grid is overlaid creating a new artificial geographical map showing the current flow in different areas, differentiating areas with high and low water flow.

The data is converted into colours corresponding to different altitudes. These altitudes depend on the water flow (in litre per second per area) and reveal the water consumption present within the

¹² Processing is a programming language, development environment, and online community that since 2001 has promoted software literacy within the visual arts. Initially created to serve as a software sketchbook and to teach fundamentals of computer programming within a visual context, Processing quickly developed into a tool for creating finished professional work as well.

urban environment. Over time, the landscape warps as data is accrued, creating virtual hills and valleys on top of the physical map.

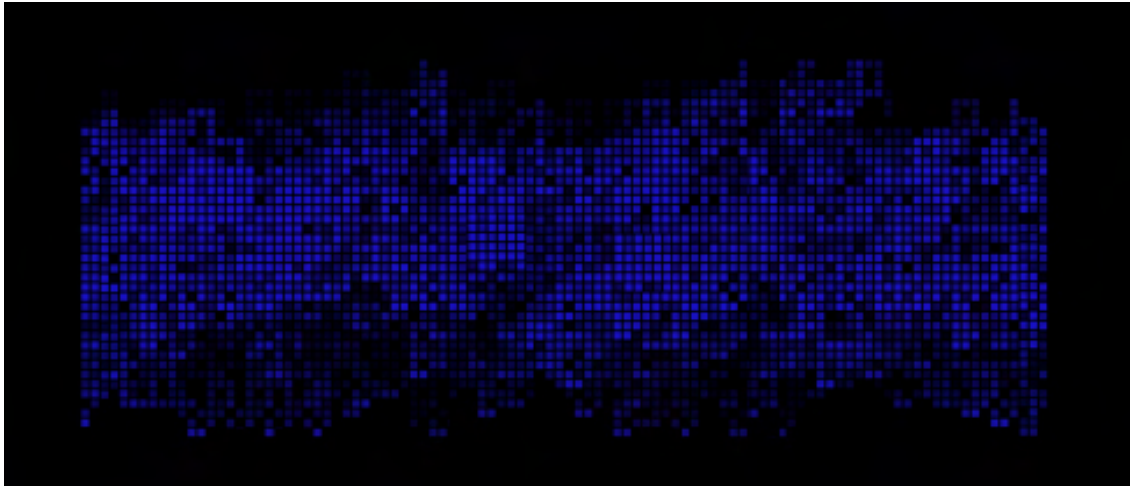


Fig. 15 Anja Braun, *The Water Project*, 2011. Scene of data transformation: 3D grid map into 2D animation.

As the project is still in progress, this could be in real-time or in aggregate depending on the change rate. In case the live feed is too slow, archived data could be used instead. Archived data is presented on the indoor screens for a better understanding of the topic. Facts, charts, numbers, text, and graphs visualize water footprints of direct and indirect water consumption, the water consumption of cities in comparison, per capita, and the relationship of industry and agriculture to water over the last 50 years, including the amount of water sold.

In general one of the main ideas is to captivate people, first by making scientific data look artful at a distance and then by informing at close range by giving more detailed information. One of the main goals is to communicate the regional water issue to the public by installing an urban intervention that creates attentiveness, awareness, and care, as well as social and behavioural change. The idea is to get people involved and engaged by interacting with the installation to provoke interest, foster thought and to take action. The content and the visualization rely on real facts and data that can be manipulated by the passers-by in a ludic way: people inside can influence or activate what is seen from outside by the spectators.

4.2 THE SEISMIC PROJECT

Even though I developed the Water Project to a substantial level of completion it became apparent, through contact with experts in the field, that the content was currently not available as open-data as needed for this project. While I am still working to get the information for the realization of the project (evidence of another reason to push the open-data movement) the lack of content required me to take another approach for my final project.

At this time the Japan earthquake in Sendai happened and made once more clear that this is a contingent issue that could be addressed in an interactive work to create awareness about the scale of natural disasters. I initiated the Seismic Project, which also combines the same techniques and actually proves out the thesis, in that I can apply the techniques readily in a different context using different content.

The given location in the gallery is a transitional space that offers two potential platforms for interaction—inside and outside the gallery—separated by a window, the outside of the gallery is an indoor space: the entrance area of the institution. The indicated interactive zones are where people can engage with the content projected onto the window-pane.

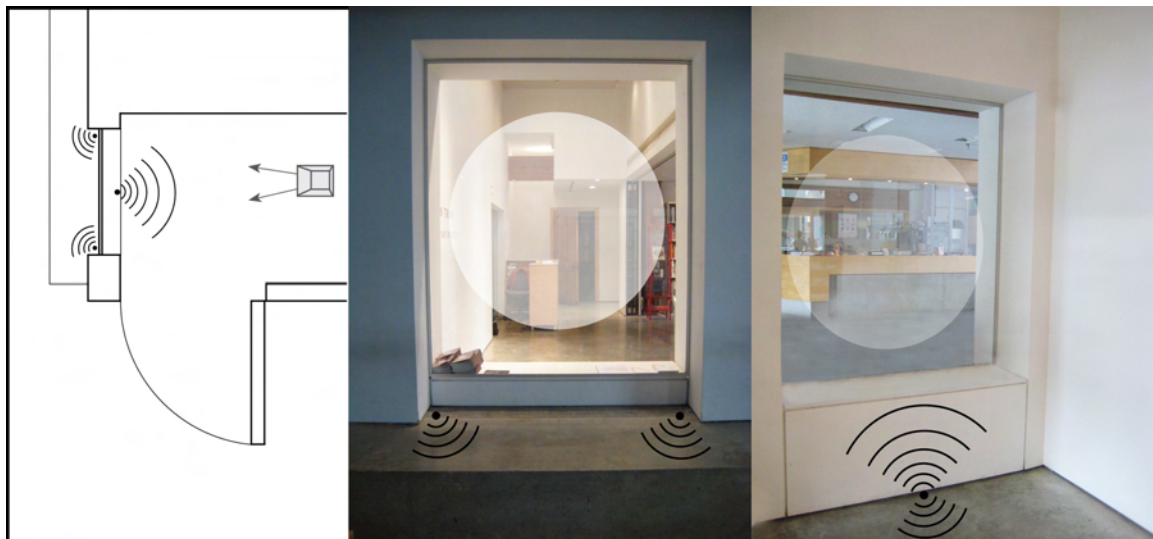


Fig. 16 Anja Braun, *The Seismic Project*, 2011. Location mock-up.

This project also incorporates the notion of interruption and sense-making: hidden microphones are capturing the noise of the passers-by, it gets linked to the different magnitude levels of an earthquake Richter Magnitude Scale¹³ depending on the level of noise or the distance to the projection, which then affects the visualization.

The Richter Scale is described as in Figure 17 which would be too much information at once for an audience and is not very tangible information: what means high, moderate or outstanding?

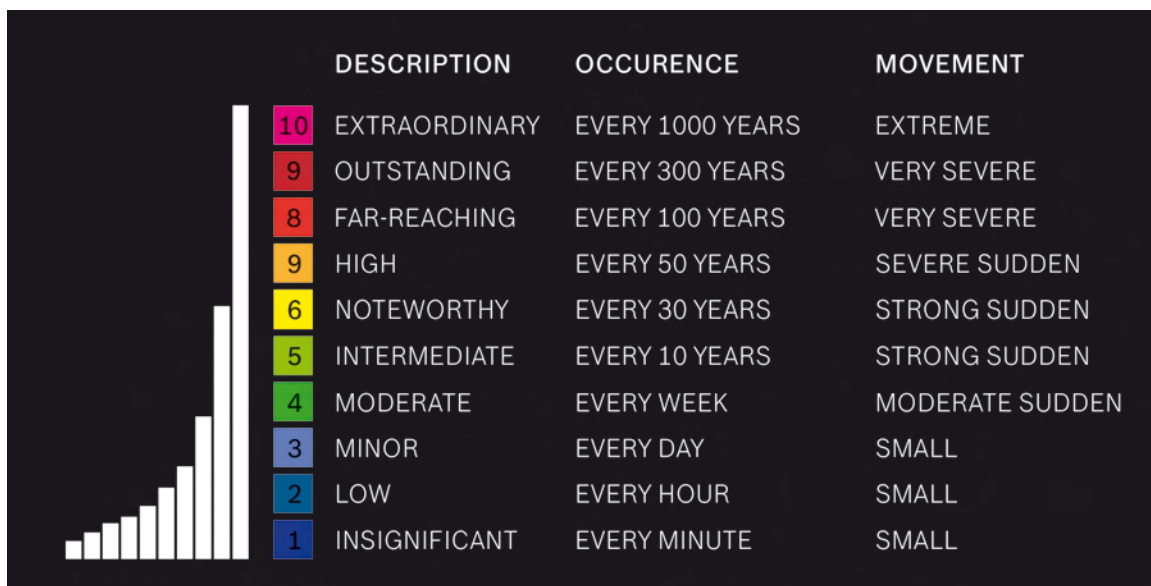


Fig. 17 Anja Braun, *The Seismic Project*, 2011. Richter Scale.

For this reason I decided to only use the descriptive explanations of impact that are given with the Richter Scale visualized in Figure 18 to give the spectator and actual participant a comprehensive explanation that one can relate to his or her own life and experiences.

¹³ The Richter Magnitude Scale was developed in 1935 by Charles F. Richter of the California Institute of Technology as a mathematical device to compare the size of earthquakes. The magnitude of an earthquake is determined from the logarithm of the amplitude of waves recorded by seismographs.

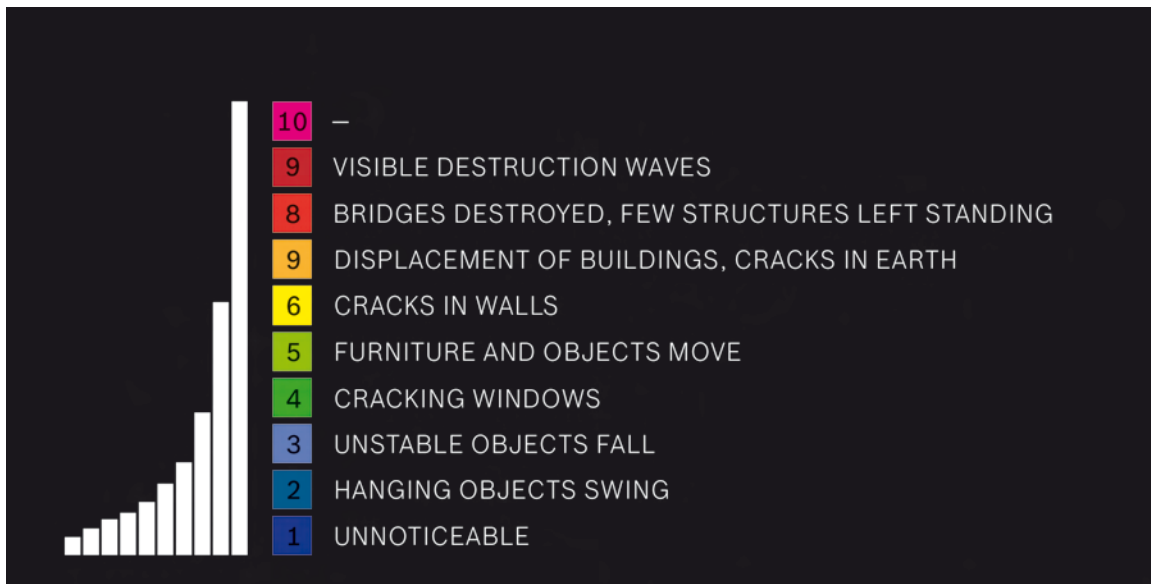


Fig. 18 Anja Braun, *The Seismic Project*, 2011. Richter Scale description.

The noise created by observers triggers different lengths of strokes depending on the intensity of the noise and is linked to a colour scheme that appears together with descriptive text and an additional number, indicating the level of magnitude of an earthquake, therewith simplifying the complexity of the Richter Magnitude Scale in a comprehensive form.

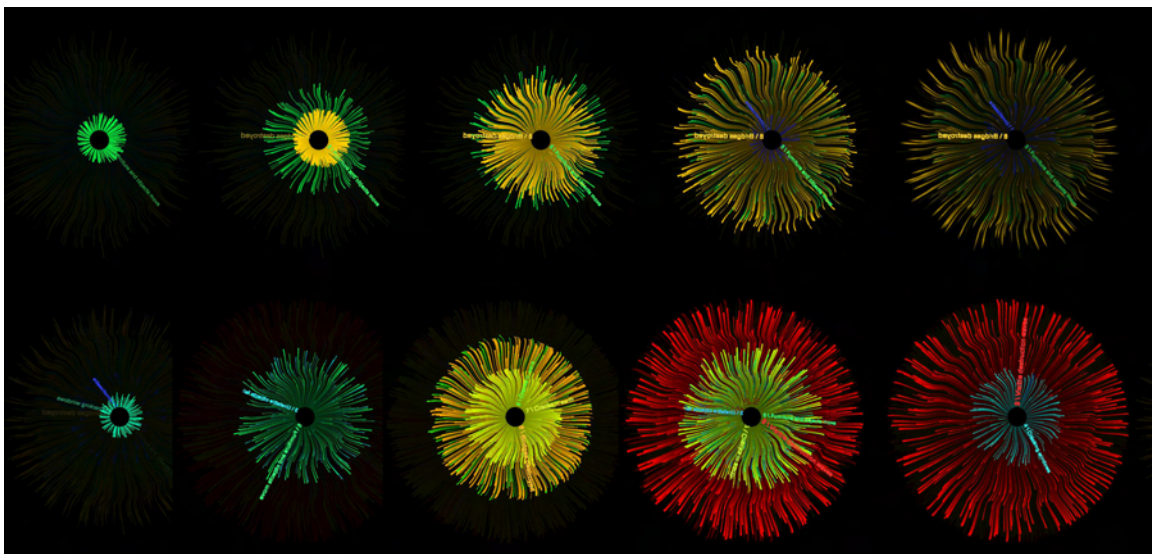


Fig. 19 Anja Braun, *The Seismic Project*, 2011. Visual series of seismic levels.

It is a manipulation of information that has to do with this idea of making strange as no sensors are visible and people have to figure out in a ludic way what is actually triggering the interaction. As a user engages with the experience over time more content is revealed and it becomes possible to build a clearer link to the themes in the piece. The text and numbers will sometimes appear mirrored for the spectator on the other side, emphasizing agency in the social space.



Fig. 20 Anja Braun, *The Seismic Project*, 2011. View from outside the gallery.

Fig. 21 Anja Braun, *The Seismic Project*, 2011. User engagement outside the gallery.

Fig. 22 Anja Braun, *The Seismic Project*, 2011. User engagement inside the gallery.

5 CONCLUSION

Two years of research into the design and use of engaging interactive environments form the backbone of this thesis work. In addition to studies of literature and existing interactive environments, my involvement in experimental research projects has provided the basis for my inquiries. In order to pursue my research agenda, I have chosen an approach that would be labelled as *practice based research*, as previously discussed in this thesis. On the basis of my approach and the resulting findings, I have developed a perspective on experience design centred on the concept of inquiry. On the most concrete level of contributions, I count the experiments and installations developed as part process and part outcome of my research. These artefacts embody specific themes, questions, and hypotheses and they can be construed as conceptual manifestations put into practice.

I have shown how the concept of practice-based inquiry can provide useful insights into both the design and use of interactive environments. The first installation presents insights into staging urban engagement with façades on the basis of the development and study of a large-scale installation that transformed the perception of a building and the experiences of it in relation to its surroundings. The second installation presents the projection progression from outside to in. The third installation presents the notion of agency and how the spectator occupies and animates the space, it is about the notion of performative perception, which denotes the simultaneous acts of interacting, perceiving, and performing that a user carries out when operating interactive systems and the consequences that these interrelated acts have for their experience of place.

The contributions have all been motivated by the framing research question: *How can content, when displayed publically in multiple contexts, use to its advantage the inherent material, technological, and social attributes of each space to create a more persuasive call to action?* My contributions do not provide exhaustive answers to this question, neither are they intended to. The question is posed in order to generate hypotheses and to drive and inspire inquiry, rather than to achieve closure. For this reason, my research process has presented a number of options for future inquiry.

5.1 EPILOGUE

Both the Water Project and the Seismic Project offer potential for further development. It is clear that within the frame of the Masters program not all aspects of a project can be addressed adequately due to time constraints or because they open up entirely new and expansive fields. From my current point of view there is a number of intriguing research prospects to explore in the future, including but not limited to the following:

Reading more into the nature of the inside and outside looking more deeply into the politics of the place is one investigation that can get pushed in the future. When looking at a space it has become clear that the politics and power structures that determine who is able and who is unable to speak must be taken into consideration.

Also, looking back at the thesis as a whole, I could summarize that the project has become less about interactivity and more about engagement (with façades). Interactivity implies a two-way involvement while engagement can imply that it is only one way. Maybe I could even state in the end that it is less about the city and space and more about the role of the façade: its length and depth, its transparency and the different surfaces that are at hand depending on the given space. Each project realized within the scope of the thesis is dealing with different levels of engagement and they are all about the notion of boundary: one deals with the façade very literally, the next one deals with the idea of going past the façade, and still two other ones have to do with setting up invisible limits to the object as it starts to react when an intruder penetrates it, starts to come closer or triggers it via noise.

We can use interaction and media as a language to communicate, and the space is an active participant in the creation of the work. If the content gets adapted to the existing space, space comes first.

My question in a way defines a problem, it is a larger kind of cultural issue: I am looking at possible techniques and systems of engagement and throughout the thesis process my focus ended up being pulled away from the city as context to public space in general (and with respect to few projects to façade in specific).

The projects are somehow in response to the idea that specific spaces are often ignored and that there are different ways in which people activate space. People transform the space into a really active site. It is also about the idea of choice: the designer with the task of choosing sites or working with a given one as content and the passer-by with the choice of resisting or engaging.

The main focus is enhanced user participation and a change of the dynamics in space to create an altered perception by placing interventions. The intervention changes space and the space changes the intervention. I see a potential in the design of non-commercial environments as a medium to stimulate discussion and debate about the social, cultural and ethical implications of existing and emerging technologies and relevant issues.

In conclusion I want to state that I have come to believe that the perception and understanding of a space changes dramatically with respect to the content placed within it, and that technology can change the relationship between people and the environment in a meaningful way: unexpectedness and curiosity can lead to an enriched experience. The information/content that is expressed on the surfaces of the built environment can potentially be emphasised by the use of technology in a way that leads to enhanced participation on the part of the public. This enhanced participation may lead the way in providing more participatory public spaces. It is also interesting that a potentially deeper engagement with content may be applied in contingent matters of civic concern, and environmental or social justice issues.

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(April, 2010)
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APPENDICES

APPENDIX I: EXPERIMENTS – DOCUMENTATION AND MATERIALS

PROCESS DOCUMENTATION of I535 Installation:

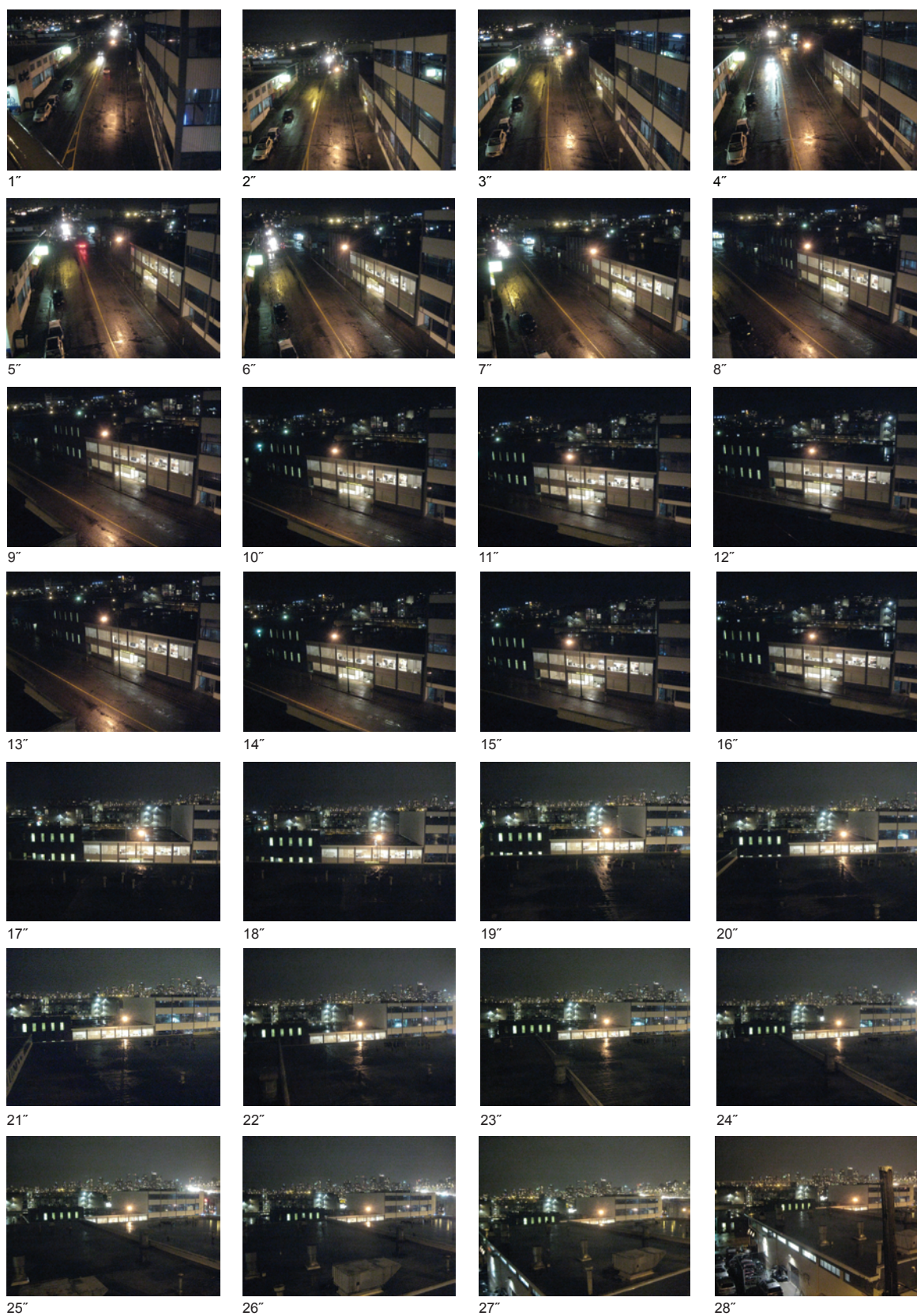


Fig. 23 Anja Braun, *I535 Installation*, 2010. Mock-up of potential location 1

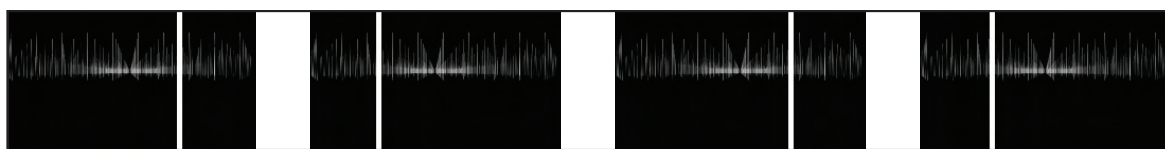


Fig. 24 Anja Braun, *I535 Installation*, 2010. Mock-up of potential location 2

PROCESS DOCUMENTATION of I535 Installation:

Fig. 25 Anja Braun, *I535 Installation*, 2010. Scenario: pedestrian on bridge

PROCESS DOCUMENTATION of I535 Installation:



SAME SCENE



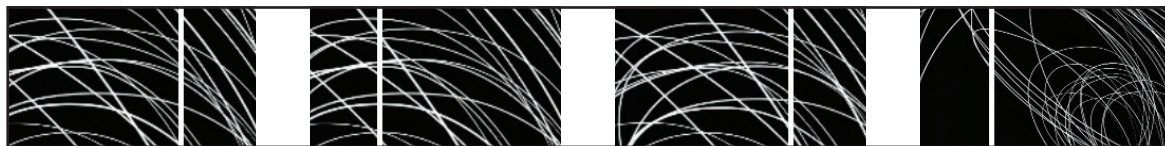
SAME SCENE / I DIFFERENT



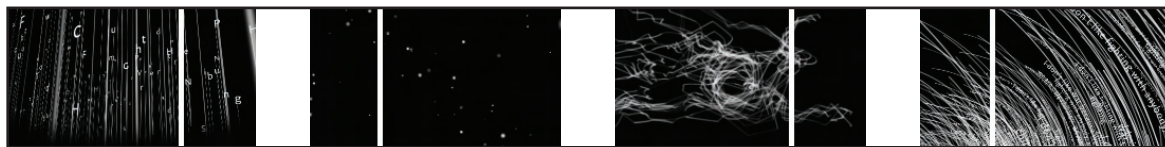
SAME SCENE / I DELAYED



SAME SCENE + SCALE / I DIFFERENT SCALE



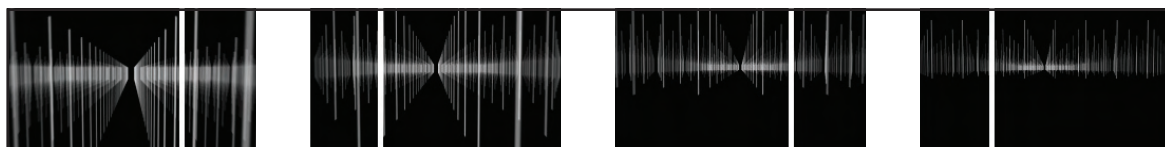
SAME SCENE / 3 SCALED



DIFFERENT SCENES



SAME SCENE + SCALE / ALL SLIGHTLY DELAYED IN DISORDER



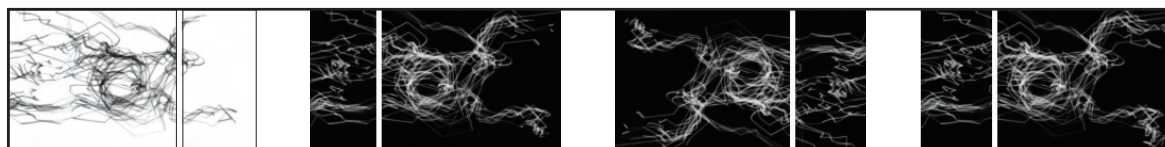
SAME SCENE / DIFFERENT SCALE / SLIGHTLY DELAYED IN ORDER

Fig. 26 Anja Braun, *I535 Installation*, 2010. Mock-up of potential channel handling of window-panes.

PROCESS DOCUMENTATION of I535 Installation:



SAME SCENE DELAYED



SAME SCENE / I INVERTED



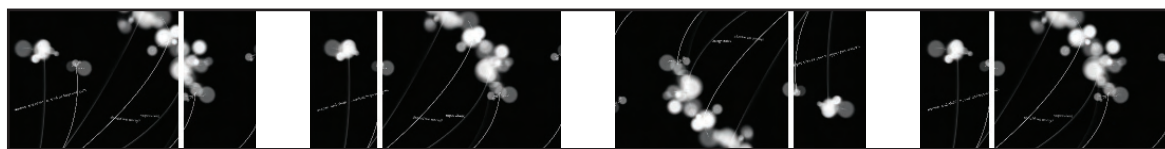
4 CHANNELS / I JUMPING SCENE



2 SCENES / DIFFERENT SCALES



RANDOMLY ACTIVATED CHANNELS



SAME SCENE / I UPSIDE DOWN



SAME START DIFFERENT SPEEDS



ONE CHANNEL

Fig. 27 Anja Braun, *I535 Installation*, 2010. Mock-up of potential channel handling of window-panes.

PROCESS DOCUMENTATION of I535 Installation:

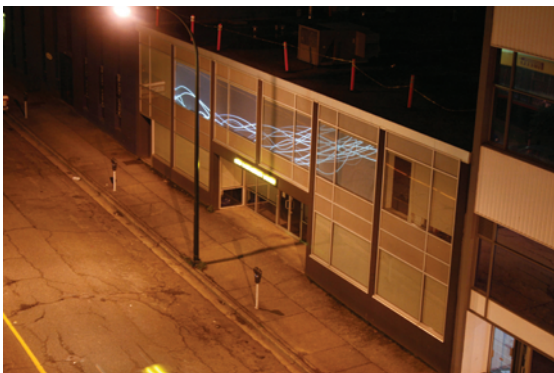


Fig. 28 Anja Braun, *I535 Installation*, 2010. Scene I



Fig. 29 Anja Braun, *I535 Installation*, 2010. Indoors



Fig. 30 Anja Braun, *I535 Installation*, 2010. Scene II



Fig. 31 Anja Braun, *I535 Installation*, 2010. Scene III



Fig. 32 Anja Braun, *I535 Installation*, 2010. Scene IV



Fig. 33 Anja Braun, *I535 Installation*, 2010. Scene V



Fig. 34 Anja Braun, *I535 Installation*, 2010. Scene VI



Fig. 35 Anja Braun, *I535 Installation*, 2010. Scene VII

PROCESS DOCUMENTATION of I 612 Installation:



Fig. 36 Anja Braun, *I 612 Installation*, 2010.
Show case I



Fig. 37 Anja Braun, *I 612 Installation*, 2010.
Show case II



Fig. 38 Anja Braun, *I 612 Installation*, 2010.
Show case III



Fig. 39 Anja Braun, *I 612 Installation*, 2010.
Show case IV



Fig. 40 Anja Braun, *I 612 Installation*, 2010.
Black box I

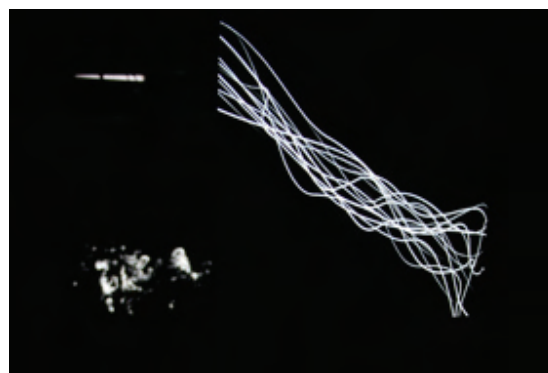


Fig. 41 Anja Braun, *I 612 Installation*, 2010.
Black box II



Fig. 42 Anja Braun, *I 612 Installation*, 2010.
One channel piece front



Fig. 43 Anja Braun, *I 612 Installation*, 2010.
One channel piece back

PROCESS DOCUMENTATION of Claustrophobic Object, Version I:



Fig. 44 Anja Braun, *I 399 Installation*, 2010.
Process: white LEDs

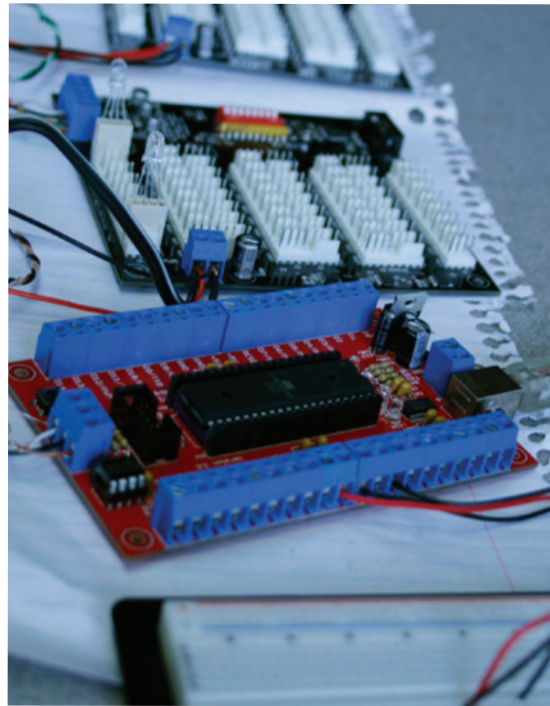


Fig. 45 Anja Braun, *I 399 Installation*, 2010.
Process: displayduino controller and
LED Matrix boards testing

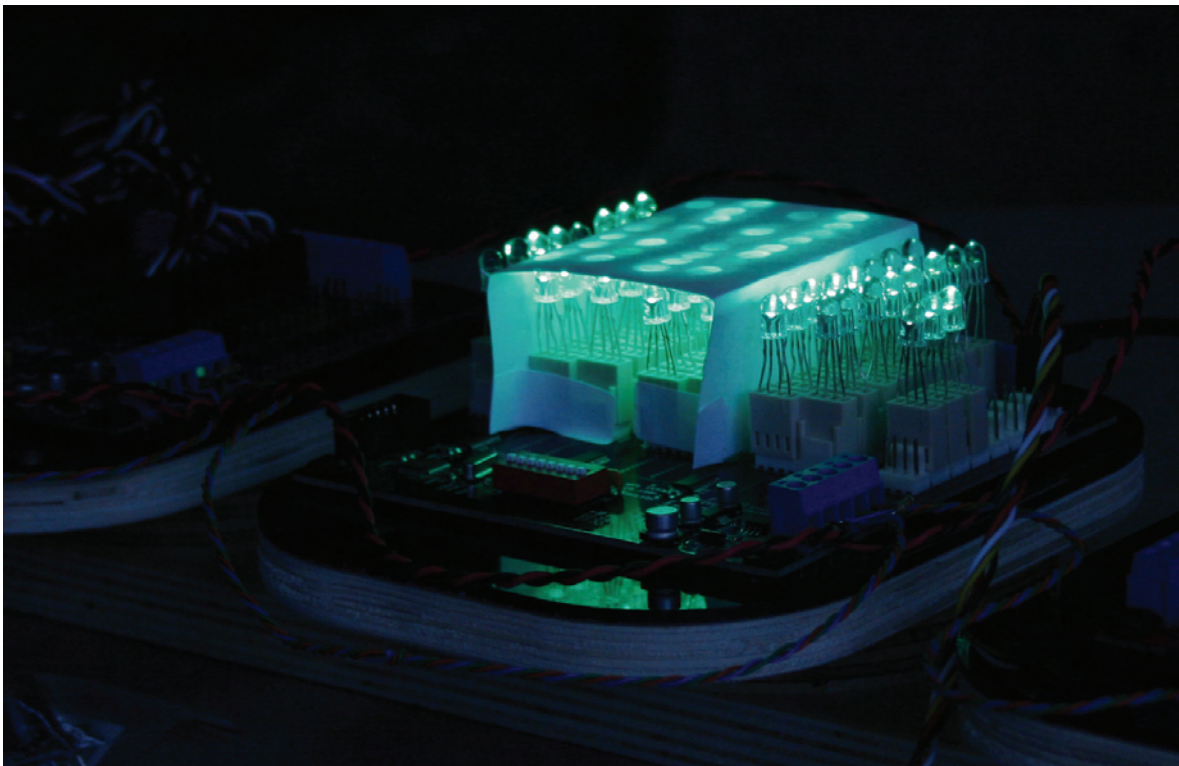


Fig. 46 Anja Braun, *I 399 Installation*, 2010. Process: first tests of arduino coding with few LEDs
on LED Matrix board

PROCESS DOCUMENTATION of Claustrophobic Object, Version I:

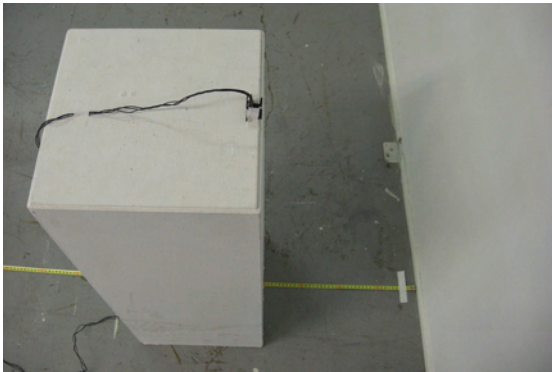


Fig. 47 Anja Braun, *I 399 Installation*, 2010.
Process: infra red sensor calibration I



Fig. 48 Anja Braun, *I 399 Installation*, 2010.
Process: infra red sensor calibration II

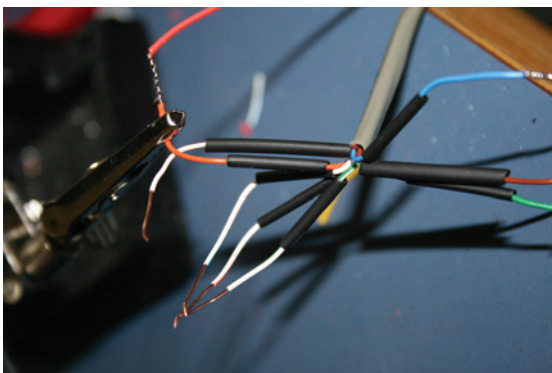


Fig. 49 Anja Braun, *I 399 Installation*, 2010.
Process: LED wiring

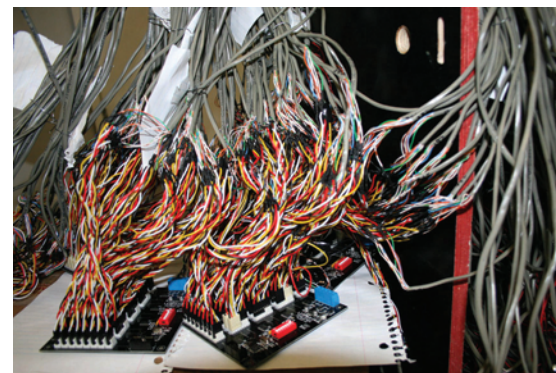


Fig. 50 Anja Braun, *I 399 Installation*, 2010.
Process: LED matrix boards wiring

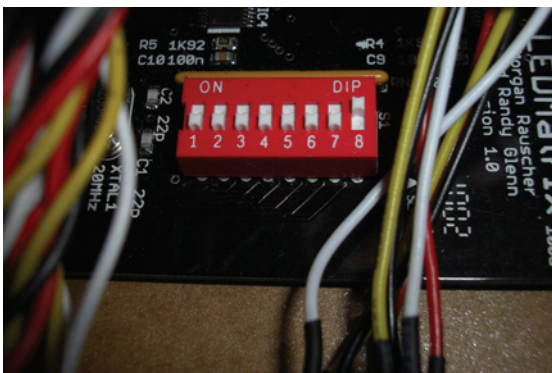


Fig. 51 Anja Braun, *I 399 Installation*, 2010.
Process: LED matrix board naming



Fig. 52 Anja Braun, *I 399 Installation*, 2010.
Process: finishing board allocation

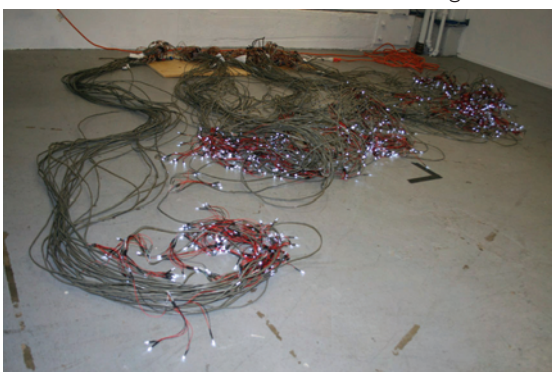


Fig. 53 Anja Braun, *I 399 Installation*, 2010.
Process: code testing



Fig. 54 Anja Braun, *I 399 Installation*, 2010.
Process: responding to user

PROCESS DOCUMENTATION of Claustrophobic Object, Version II:

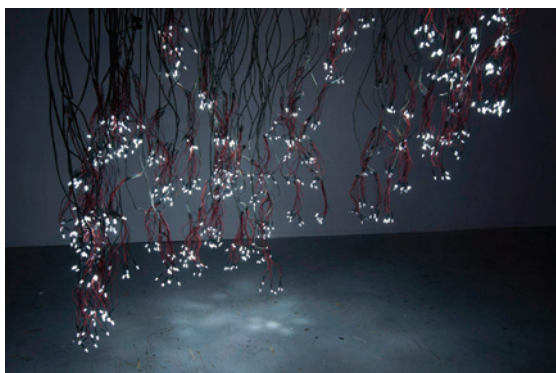


Fig. 55 Anja Braun, *The Claustrophobic Object, Version II*, 2010. In sleep mode.



Fig. 56 Anja Braun, *The Claustrophobic Object, Version II*, 2010. Invader is entering the active zone of the LED object; it brightens up.



Fig. 57 Anja Braun, *The Claustrophobic Object, Version II*, 2010. Invader approaching the LED object, agitated mode.

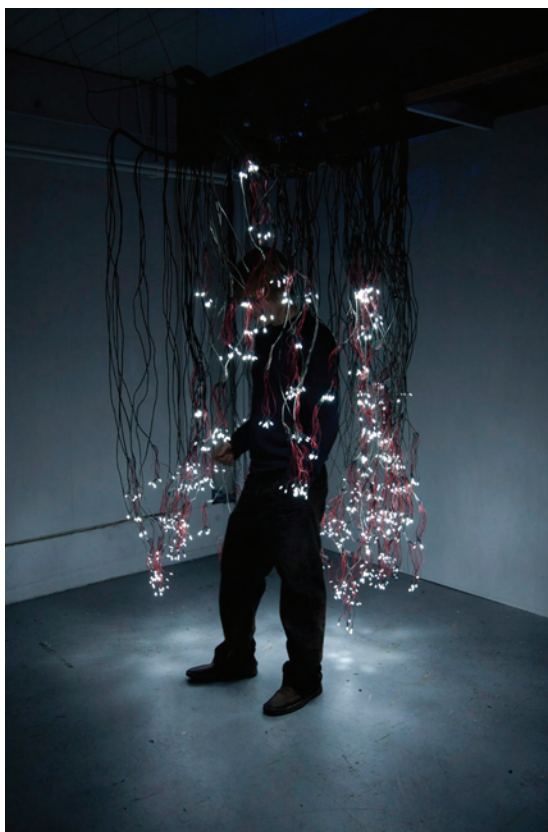


Fig. 58 Anja Braun, *The Claustrophobic Object, Version II*, 2010. Invader is actively interacting with the LED object, panicking mode.

APPENDIX II: THE WATER PROJECT – VISUAL MATERIALS

PROCESS DOCUMENTATION of The Water Project:

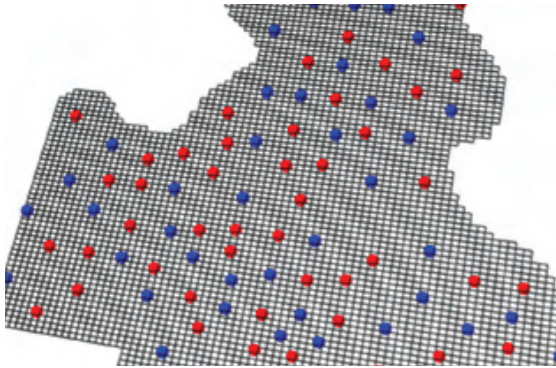


Fig. 59 Anja Braun, *The Water Project*, 2011.
Data collection points on geographical
map measuring water flow in l per min.

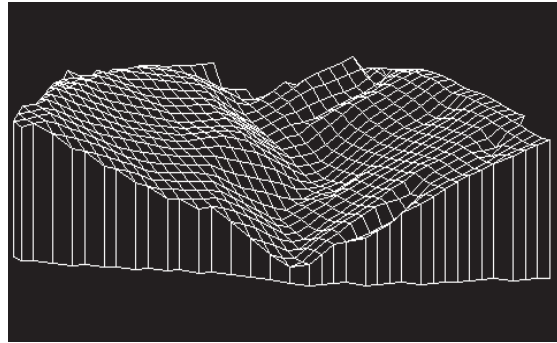


Fig. 60 Anja Braun, *The Water Project*, 2011.
Virtual grid map on top of geographical
map representing actual water flow.

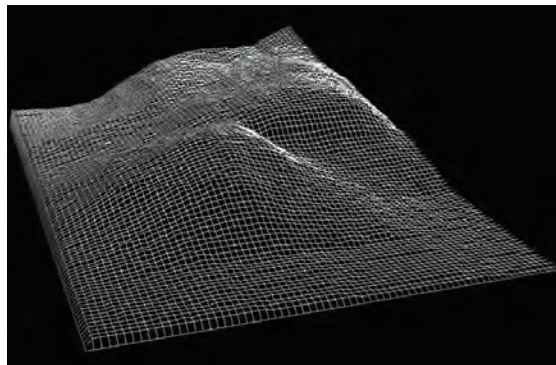


Fig. 61 Anja Braun, *The Water Project*, 2011.
Virtual grid changes depending on
water flow.

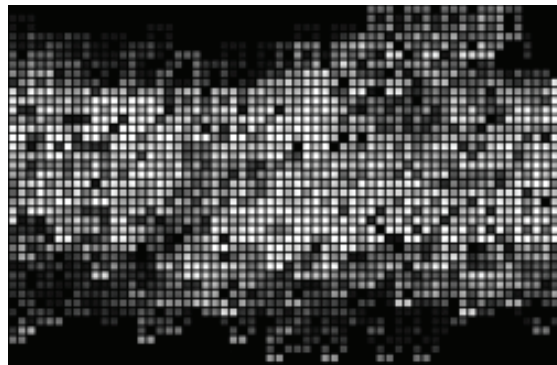


Fig. 62 Anja Braun, *The Water Project*, 2011.
Scene of data transformation from 3D
grid map into 2D animation.

PROCESS DOCUMENTATION of The Water Project:

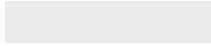
INSIDE DESCRIPTION:

LARGE LOW-RES VERSION:



large scale projection
that people can see from the street

SMALL HIGH-RES VERSIONS:



screens in show cases
that people can engage with while walking
along the bridge



ELEMENTS & CONTENT:

- A big screen
- B monitor I
- C monitor II
- D monitor III
- E web cams
- F projectors

- A big grid map
- B stats and facts
- C timeline of waterconsumption
- D water footprint facts
- E A (overlay)
- F A

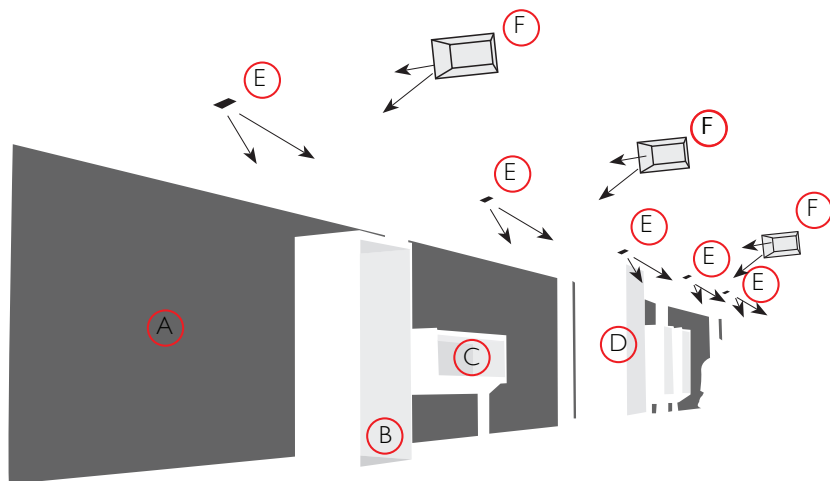


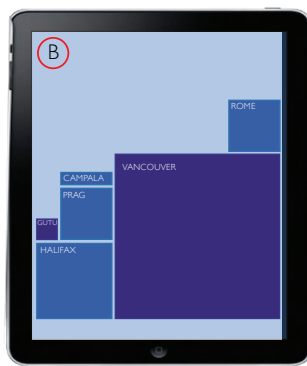
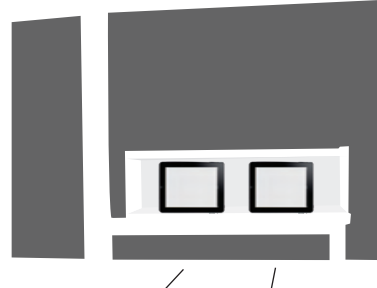
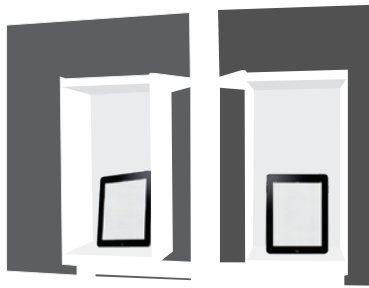
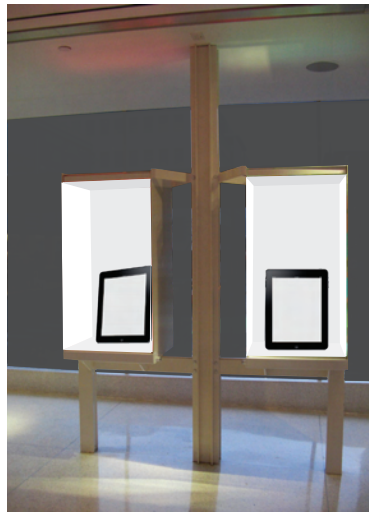
Fig. 63 Anja Braun, The Water Project, 2011. Scenario mock-up.

PROCESS DOCUMENTATION of The Water Project:

ELEMENTS & CONTENT:

- A big screen
- B monitor I
- C monitor II
- D monitor III
- E web cams
- F projectors

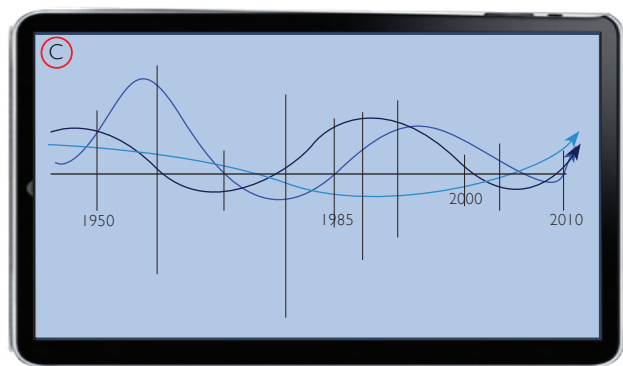
- A big grid map
- B stats and facts
- C waterconsumption timeline
- D water footprint facts
- A (overlay)
- A



CITIES IN COMPARISON



WATER FOOTPRINTS:
direct & indirect water
consumption in l



TIMELINE OF WATERCONSUMPTION:
per capita, industry, agriculture, sold water

Fig. 64 Anja Braun, The Water Project, 2011. Scenario mock-up and graphics.

PROCESS DOCUMENTATION of The Water Project:

B

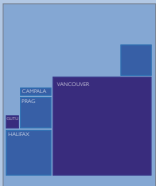
FRESHWATER WITHDRAWL BY CITY/COUNTRY

The use of water varies greatly from country to country and from region to region. Data on water use by regions and by different economic sectors are among the most sought after in the water resources area. Ironically, these data are often the least reliable and most inconsistent of all water-resources information.

This table includes the data available on total freshwater withdrawals by country in cubic kilometers per year. "Withdrawal" typically refers to water taken from a water source for use. It does not refer to water "consumed" in that use. The domestic sector typically includes household and municipal uses as well as commercial and governmental water use.

The industrial sector includes water used for power plant cooling and industrial production. The agricultural sector includes water for irrigation and livestock. A major limitation of these data is that they do not include the use of rainfall in agriculture.

Many countries use a significant fraction of the rain falling on their territory for agricultural production, but this water use is neither accurately measured nor reported in this set.




www.thewaterproject.ca

D

WATERFOOTPRINTS

People use lots of water for drinking, cooking and washing, but even more for producing things such as food, paper, cotton clothes, etc. The water footprint is an indicator of water use that looks at both direct and indirect water use of a consumer or producer. The water footprint of an individual, community or business is defined as the total volume of freshwater that is used to produce the goods and services consumed by the individual or community or produced by the business.

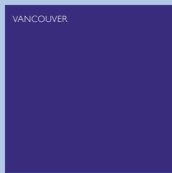
The interest in the water footprint is rooted in the recognition that human impacts on freshwater systems can ultimately be linked to human consumption, and that issues like water shortages and pollution can be better understood and addressed by considering production and supply chains as a whole. Water problems are often closely tied to the structure of the global economy. Many countries have significantly externalised their water footprint, importing water-intensive goods from elsewhere. This puts pressure on the water resources in the exporting regions, where too often mechanisms for wise water governance and conservation are lacking. Not only governments, but also consumers, businesses and civil society commu

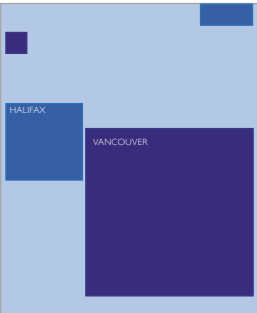


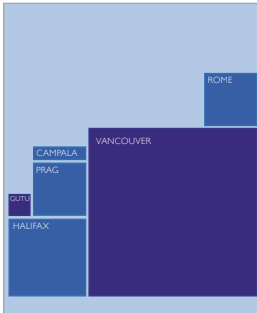
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INFORMATIVE TEXT ON SCREENS

B








FRESHWATER WITHDRAWL BY COUNTRY

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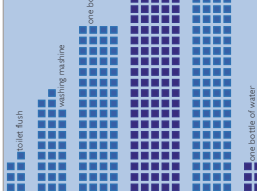
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D







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Fig. 65 Anja Braun, The Water Project, 2011. Screen graphics.

PROCESS DOCUMENTATION of The Water Project:



INDUSTRY

The water industry comprises many diverse companies, products, and operations, ranging from the production of pipes and water meters to desalination plants, sophisticated wastewater treatment systems, water utilities, and water-related consulting. This table provides a summary of the revenue earned by the CAN water industry. Most sectors are projecting growth under 10 percent annually, but specific companies and subsectors may see more rapid growth, or may see regional differences in efforts and funding.

The biggest amount of this water is hidden in the food or products that are produced each day. Unlike many countries where agricultural water use dominates, Canada is typical of northern industrialized countries in that power production, manufacturing and municipalities are the principle water-using sectors. Water use in mining and oil and gas extraction is relatively small from a national perspective but can be important in specific watersheds and for its impacts on local water quality.

There are a number of characteristics that distinguish the manufacturing sector's water use. First, manufacturing water use, like agricultural water use, is mostly self-supplied.

PER CAPITA

In the past years, the water use in Canadian households as well as in the industrial sector has increased constantly. This trend leads to future problems. But this amount of water only represents a small portion of the total water the Canadians consume on a daily basis.

A considerably higher portion is hidden in the food, clothes and other products that citizens use or consume in everyday life. Since many of the products consumed come from abroad, Canada has a significant external water footprint.

Water plays an important role in both Canada and the United States. Both Canadians and Americans are considered to be the world's most consumers of water. They use 100 gallons per day per person which are mostly lost in toilets and bath drains. Moreover, their usage of drinking fresh water is three times higher than that in Europe. Water also plays an essential role in agriculture in which irrigation is considered to be the biggest user of water. It accounts for 80% of water consumption.

SOLD WATER

Canada sells every year a huge amount of water to the United States. Canada possesses 20% of the earth's fresh water. Half of this percentage is renewable and can be accessed from rivers and lakes. While the rest of it remains untouchable in the form of snow in the north.

Water has fast become an issue of national security and geopolitical power, as crucial to national interests as energy. Drought in areas such as Atlanta and North Carolina is part of a much larger crisis in the United States where vast regions are suffering water shortages and demand is outstripping supply. Bulk water exports are touted as a quick fix to water shortages and the obvious place the U.S. would look for new sources of drinking water is Canada.



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INFORMATIVE TEXT ON SCREENS

Fig. 66 Anja Braun, The Water Project, 2011. Screen graphics.